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AMERICAN RIVER PARKWAY
GENERAL REVIEW PROGRAM
STUDY REPORT I

DRAFT

SEPTEMBER 14, 1973

FOR

SACRAMENTO COUNTY

DEPARTMENT OF PARKS AND RECREATION

DRAFT

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TABLE OF CONTENTS

PREFACE

SUMMARY

INTRODUCTION 1

I EXISTING CONDITIONS 6

A. MAJOR ENVIRONMENTAL CONDITIONS

1. Vegetation 6
2. Wildlife 14
3. Parkway Ecology - South Bank 18
4. Parkway Ecology - North Bank 20
5. Pesticides and Herbicides 21
6. Nature Versus Recreation 22
7. Slopes 27
8. Erosion 28
9. Floods 29
10. Archaeology 30
11. Historical Sites 39

B. MAJOR DEVELOPMENTAL CONDITIONS 44

1. Introduction 44
2. Regional Context 45
3. Vicinity of the American River 47
4. Regulating Land Use and Development 54
5. Conclusion 59

C. MAJOR RECREATION CONDITIONS 61

II. CRITIQUE OF THE 1968 PARKWAY PLAN 65

A. JURISDICTIONS IN THE PARKWAY AND ADJACENT LANDS 66

B. PLAN IMPLEMENTATION 68

C. LAND CATEGORIES WITHIN THE PARKWAY 71

D. USES WITHIN THE PARKWAY 71

E. RELATING THE PARKWAY TO EXTERNAL CONDITIONS 72

III NATURAL AND RECREATION AREAS 73

A. INTRODUCTION 73

B. METHOD OF ANALYSIS 75

PREFACE

This Study Report is a first in the series of five such Study Reports that are being prepared as part of a General Review of the American River Parkway Plans. These reports are being issued from time to time by Environmental Assessment Engineering, to initiate discussion and comment during the preliminary stages of the General Review Program. For this Study Report, and each of these subsequent reports, the Sacramento County Recreation and Parks Commission shall conduct hearings in order to receive comments on the information and recommendations provided by the consultants.

These Study Reports and hearing procedures are designed to obtain from public agencies, private groups, and interested citizens, information and opinions concerning the character and form of the American River Parkway, so that these may be reflected adequately in the review and evaluation of the General and Specific Plans for the Parkway.

Study Report I discusses the general conditions and problems in the Parkway, evaluates the Plan texts, and evaluates the locations of Natural and Recreation Areas in the Parkway. Subsequent Study Reports will discuss specific problems of the Parkway, including access, trails in the Parkway, implementation of the Parkway Plan, and significant other problems facing the future of the American River Parkway. The Final Report will encompass the contents of the five Study Reports, taking into account the comments received in the course of the Study Report Hearings.

SUMMARY

The existing American River Parkway Plans were adopted in the late 1960's by the County and City of Sacramento, setting as a basic goal the preservation of a natural open space greenbelt along the River within Sacramento County. The current Plan Review Program accepts these premises for the Parkway:

- that significant natural areas be preserved;
- that only recreation compatible with the natural features of the River be included in the Plan.

Environmental conditions that have been identified thus far include:

- The Parkway has almost no areas of undisturbed natural vegetation.
- The ecosystems are very sensitive to trampling, abrasion and, overuse in recreation areas resulting from sheer numbers of people.
- Freshwater marsh is the best vegetative unit for a designated natural area; oak woodland is second.
- Riparian vegetation is the most hardy and resilient, and is therefore the best for recreation areas.
- Grassland has the least valuable natural qualities, but lack of shade and presence of much star thistle hinder recreation uses.
- Archaeological sites, numbering 23 within the study area, of which three are present on County-owned property, are best protected by limited ingress; planted grass or covering with gravel are second choices.

Significant developmental conditions identified include:

- Running through the urban and urbanizing portion of Sacramento County, the American River is the major open space and recreation resource within this region.

- Communities bordering the River have been among the fastest growing in the County.

- Along with population growth, traffic along and across the River has grown dramatically. US-50, parallelling the River, will likely stimulate further development. Four new River crossings are proposed, and if approved would be completed within the next two decades.

- City and County land use planning foresees development adjacent to the Parkway to the extent that "ultimately" no major open space now bordering the Parkway would exist.

- No comprehensive evaluation procedures and criteria have been adopted by either the City or County for review of proposed developments bordering the Parkway.

Between 1967 and 1973, active recreation usage in the Parkway expanded dramatically, roughly by 160%.

A critique of the existing Specific and General American River Parkway Plans highlights that:

- Contradictions between some of the stated "basic goals and policies" thwart effective Parkway preservation and management. Among the most important goal conflicts is that of natural area protection versus extensive public recreation.

- The Plan under-estimates the impact which an urban environment has on the Parkway. Problems stemming from expanded use and encroaching development were not foreseen or dealth with.

- The Parkway reference line, as only a policy guideline for City and County governments, is sometimes difficult

to enforce as a line of demarcation between protected Parkway and development.

- Too little emphasis has been given the role which must be played by jurisdictions besides the County Parks and Recreation Department in supporting and implementing the Plan. More cooperation is needed in terms of flood control and water-resource jurisdictions, land use regulations, and circulation planning, for instance.

INTRODUCTION

In 1962, the concept of the American River Parkway was adopted and made part of the Recreation Element of the Sacramento County General Plan. The intent of this action was to preserve a natural open space greenbelt along the entire length of the River within Sacramento County. In 1968, the Sacramento County Board of Supervisors approved the General Plan of the American River Parkway, covering the entire length of the American River from the Sacramento River to Folsom Dam. Concurrently, a Specific Plan for the County portions of the Parkway was adopted. Subsequently a Specific Plan for the Sacramento City portion of the Parkway was adopted in 1969. Four years later, County voters approved the sale of bonds for the County's Recreation and Park Program. Included in this Program are substantial monies for acquisition and development of the American River Parkway.

During the years since the Parkway concept and the General and Specific Plans were developed and approved, Sacramento County has experienced substantial expansion of its population and urbanized area. This has brought with it considerable new development, much of it in the environs of the American River. As a direct consequence, available open area in Sacramento County's urbanized region has decreased. In addition, the leisure activities of the enlarged population have substantially increased the usage of the American River as a recreation area. The increasingly urban nature of the environs of the Parkway, and the greatly increased recreation usage of the Parkway today stand as major challenges to the concepts of

the original American River Parkway Plans.

The overall goals and amenities desired for the American River Parkway are stated in the General Plan as follows:

> It is desired that the American River Parkway be an open space greenbelt extending continuously and unbroken from the Sacramento River into the High Sierra.
>
> It is desired that the amenities of the River, including its environment and open space be permanently preserved for public enjoyment.
>
> It is desired that the existing natural river banks and wilderness areas remain as unchanged as possible and be protected as a natural wildlife and plant habitat.
>
> It is desired that appropriate access facilities be provided so that the public might conveniently reach and enjoy the amenities of the Parkway.

The reconciliation of the above goals with sustained pressures for development, and with substantial demand on the County's recreation facilities may require some hard choices on the part of the citizens of Sacramento County. A pressing illustration of the difficulty is the heavy usage of the American River, particularly on weekends. Sustained or increased heavy usage and enjoyment of the River can bring with it a deterioration or even loss of the very natural conditions which the Parkway was intended to preserve. During the course of the General Review Program, the consultants will consider the feasibility and means for achieving the above goals. Proper planning and design of the Parkway and its facilities can assist preservation of the natural character of the Parkway. However, it remains for the citizens of Sacramento County to affirm their support of those goals by adopting the appropriate

regulatory measures.

A fundamental assumption for maintaining the natural character of the Parkway is that the Parkway is not intended to serve as the sole regional recreation facility in Sacramento County. A unique characteristic of the American River Parkway is that it still possesses natural features as it wends through an urbanizing area. Development of some recreation facilities in the Parkway may be desirable. However, a useful question to ask of any recreation activity or facility proposed for the Parkway is "Does this facility specifically require the American River or its vicinity?" Many recreation facilities that do not require the American River vicinity are better located elsewhere, if convenient, so as to lessen the pressure on the Parkway.

On the other hand, the location of the American River in Sacramento County does not permit a total, all-encompassing wilderness experience. If the natural character of the American River Parkway is to be preserved, the Parkway must be considered as a specific, unique open space and recreation facility in the total County regional recreation system.

The consultants accept as an operating premise of the plan evaluation:

- That the significant natural areas of the Parkway be preserved and enhanced.
- That only those recreation facilities and activities which are compatible with the natural amenities of the River be included in the Plan.

The basic information presented herein provides the general guidance for use during the detailed evaluation process to be conducted during the remainder of the Plan Review Program. The policy indicators reflected in this Study Report will require consideration in conjunction with the specific environmental, developmental and recreational conditions operating at a given location on the Parkway. A most pressing instance of this is the evaluation of access points. Design standards are implied herein, but they must be hedged with numerous exceptions and conditions in order to be pertinent for a given Parkway feature and location. This evaluation of specifics, including the applicable constraints and standards, are the content of the subsequent Study Reports.

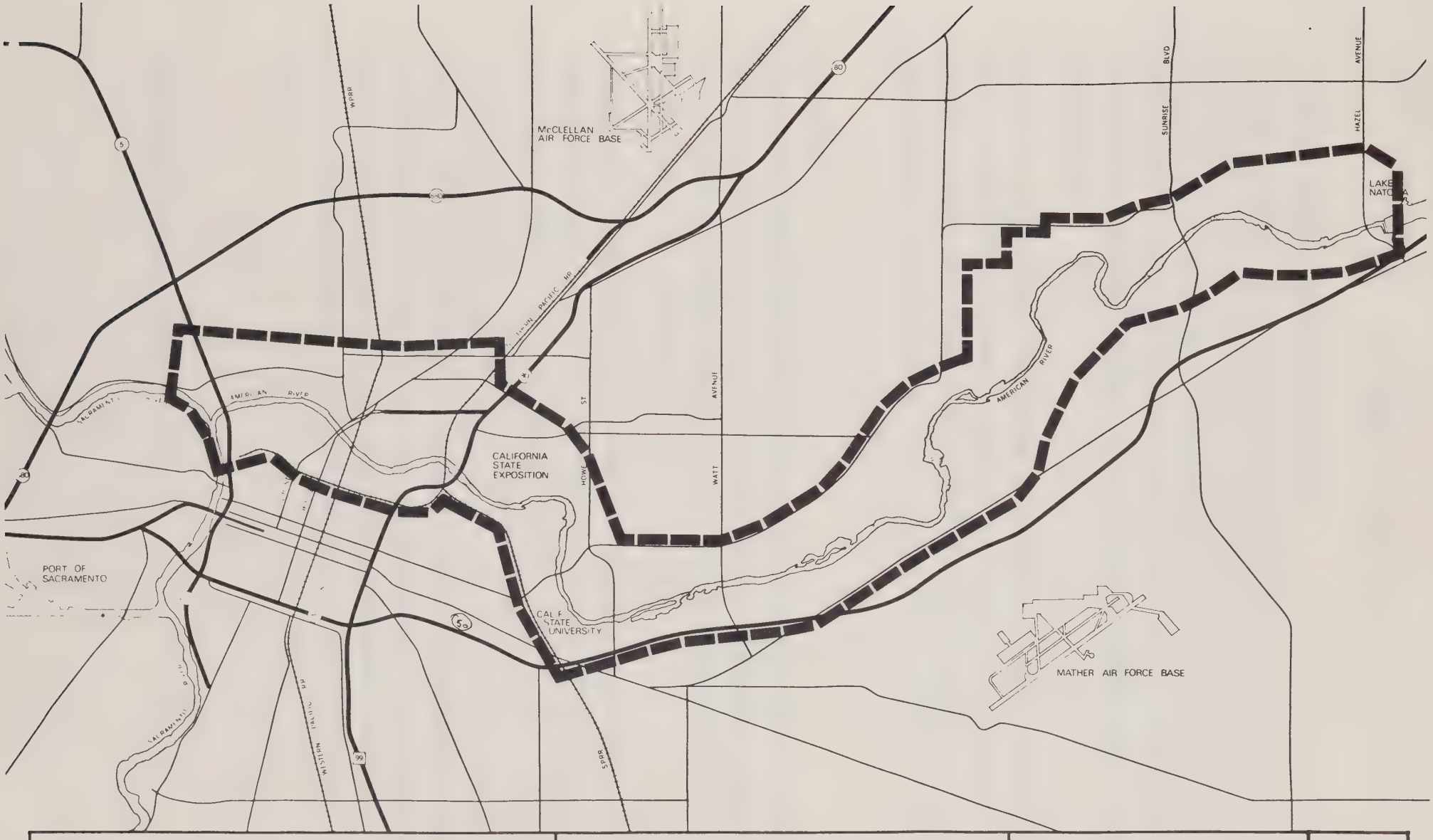
This evaluation of the American River Parkway is concerned with that portion within the jurisdiction of the County and City of Sacramento. The limits are generally from Nimbus Dam in the eastern portion of the County, downstream to the mouth at the Sacramento River. The environs of the Parkway further upstream from Nimbus Dam are state and federally owned lands. Planning and implementation of that portion of the Parkway is dependent on the coordinated plans and actions of those agencies. For this reason, the upstream portion is not being treated in this evaluation of the Parkway plans.

The Environmental Study Area of the Parkway generally covers the Parkway boundaries shown in the approved General and Specific Plans. Some additional areas that might have significant impact on the

immediate vicinity of the Parkway have also been included within the Environmental Study boundaries. In addition to the immediate Parkway examination, a broader, more general boundary was established for consideration of the population and development conditions that may have an impact on the Parkway. This wider Developmental Study Area covers from one-fourth to one mile on either side of the River. The detailed maps showing this and other information will be available for inspection at the Recreation and Parks Commission Hearing on this Study Report.

Several terms that are used frequently in this report are defined as follows:

Native:	Plant species that are indigenous to its locale.
Natural:	Native vegetation in which man's effects on the environment are relatively unnoticeable.
Naturalistic:	Native or non-native (introduced) vegetation in which man's effects on the environment are relatively unnoticeable.
Natural Area:	As defined in the 1968 Parkway Plan, a continuous strip within the Parkway in which the environment will be encouraged to develop naturally.
Recreation Area:	As defined in the 1968 Parkway Plan, an area to be devoted to active and passive urban-type park uses.



PARKWAY LOCATION MAP

DEVELOPMENTAL STUDY BOUNDARY

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I EXISTING CONDITIONS

A. MAJOR ENVIRONMENTAL CONDITIONS

The basic philosophy of the American River Parkway planning is to fit the recreational development and human activities into the existing natural or naturalistic environment and to provide for recreational and esthetic enjoyment while preserving these resources to the greatest possible extent. The first step in this planning process is to describe the existing environment and to identify conditions that impose constraints on developments and uses.

The major environmental factors include vegetation and wildlife, with the topography geology, and soils being significant in some areas. The potential for flooding and erosion must also be considered. Past uses of the area are also significant either in the effects they have had on the land or the possible remnants of historical or archeological value.

1. Vegetation

In line with the philosophy of fitting development and human activities into the existing environment, it is appropriate to identify vegetative classifications such that each unit is reasonably homogeneous and each has different significance for wildlife and different potential for human use.

Munz and Keck* identified a number of plant communities, three of which are found along the Parkway. These groups are regional in distribution and it was necessary to modify and subdivide these into ones that would be useful to this study. The three units described by Munz and Keck were climax plant associations. A climax situation (a stable and unchanging species composition) is indeed uncommon along the river. In essence, the entire Parkway is a transition between the wooded Sierra foothills and the open grassland of the Sacramento Valley. The transition area, in ecological terms, an ecotone, is the area where two or more climax groups merge together. Although pure grassland and woodland are present, the transitional zones of vegetation are more common.

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* California Plant Communities, 1949.

A great deal of disturbance, ranging from the massive gold dredging of the flood plain in the first part of this centry, to the excessive use of "off-the-road" vehicles in modern times, has played an important role in modifying this ecotone. The river has also contributed its own form of disturbance, and thus, a unique flora. These changes in the physical environment have resulted in corresponding changes in the flora, mostly in the introduction of invader plants. The replacement of native grasses with ripgut, foxtail and star thistle in the open grasslands is a notable example. With these considerations in mind, the following six vegetative units were devised:

1. Oak Woodland
2. Oak Grassland
3. Grassland
4. Shrub Grassland
5. Riparian
6. Freshwater Marsh

Pockets of these vegetative units, and their associated animal life, are usually discernible although the boundaries may be obscure in places. The physical features of the land, that is, the topography, exposure, groundwater and many others, play an important role in describing the edges of vegetative units, as well as the species composition itself. For example, abrupt changes in exposure will resent in a definitive vegetational change. Although a gradual change from one unit to another is most common, it was necessary for organization and visual interpretation to draw distinct boundaries between them.

a. Oak Woodland (Canopy greater than 90 percent): One plant community identified by Munz and Keck was the Oak Woodland. This heavily wooded area has an especially closed canopy consisting primarily of valley and interior live oaks, but California black walnut, locust, tree of heaven, and cottonwood are common on wetter sites. The dense overstory formed by the trees tends to retard evaporation and the retained surface moisture enhances the herbaceous growth in the understory. Wild grape and wild cucumber are profuse in the lower levels of vegetation, and fruit-yielding blackberry is especially abundant. This plant is most important as wildlife habitat. Many animals live their entire lives within and along the edge of the Oak Woodland while

others find this a desirable rest stop on their annual migration. Although the thickets make excellent habitat for the wild creatures, man has much difficulty traversing the dense network of vines and shrubs.

Typical flora found in this unit are as follows:

Valley Oak	Quercus lobata
Interior Live Oak	Quercus wislizenii
Blackberry	Rubus vitifolius
Poison Oak	Rhus diversiloba
California Black Walnut	Juglans hindsii
Wild Grape	Vitis californica
Wild Cucumber	Marah fabaceus
Mugwart	Artemisia douglassiana
Curly Dock	Rumex crispus
Sweet Anise	Foeniculum vulgare
Tree of Heaven	Ailanthus altissima
Locust	Robinia pseudo-acacia
Cottonwood	Populus fremontii

b. Grassland (Canopy less than 10 percent): The grassland vegetative type is found along the Parkway but outside of the normal flood zone and consists almost exclusively of invader forbs and grasses. This type is most commonly found on flat land. In its pristine environment, before the white man so severely overstocked and otherwise disturbed this rangeland, perennials such as needle grass, pine blue grass, and poverty three-awn comprised the bulk of the ground cover. Now, after years of abuse, ripgut, foxtail brome, wild oat and star thistle have replaced the more succulent natives. These plants thrive under disturbance, quickly taking root on fresh, bare ground.

The average annual rainfall (18"), the average number of frost-free days (316), and the average maximum (73°F) and minimum (48°F) temperature are generally uniform for the Parkway; the physical features of the land undoubtedly play the major role in determining the location of grassland. Exposure to the sun's drying rays and the

lack of available groundwater has inhibited other forms of plant growth, leaving a suitable environment for only the more tolerant grasses and forbs.

The following are typical species for this unit:

Wild oats	Avena fatua
Ripgut grass	Bromus rigidus
Star Thistle	Centaurea solstitialis
Soft Chess	Bromus mollis
Foxtail brome	Bromus rubens
Annual bluegrass	Poa annua
Foxtail fescue	Festuca megalura
Mustard – three species	Brassica campestris Sisymbrium officinale Brassica geniculata
Buckwheat	Eriogonum sp.
Pentstemon – two species	Penstemon heterophyllus Penstemon breviflorus
Filaree – three species	Erodium cicutarium Erodium botrys Erodium moschatum
Shooting star	Dodecatheon hendersonii
Buttercup	Ranunculus californica
Larkspur	Delphinium sp.
California fuchsia	Zauschneria californica
Deer weed	Lotus scoparius
Vetch – two species	Vicia angustifolia Vicia dasycarpa
Mexican tea	Chenopodium ambrosioides
Tarweed	Hemizonia virgita

c. Riparian: The riparian zone is found within the River's flood plan. This zone is far too harsh for all except rather specialized flora. The obvious preponderance of towering cottonwoods and hearty willows attests to the viability of these species which, year after year, endure the ravages of winter flooding. It is common to find elderberry, blackberry, wild grape and other shrubs and vines growing in profusion immediately adjacent to bare sandbars or swift currents. These thickets provide cover for

many wildlife species. Many animals, especially birds, have adapted specifically to this type of habitat and are as able to compensate for the rigors of this environment by either moving out or adjusting their behavior. Trees such as California black walnut, Oregon ash and the introduced tree of heaven have found suitable habitat further away from the River, sheltered from the fluctuations in the water level. As the River influence decreases, the vegetation transitions into the Oak Woodland or Grassland types.

This unit typically includes the following species:

Willow – three species	Salix lasiolepis Salix hindsiana Salix laevigata
Cottonwood	Populus fremontii
California Black Walnut	Juglans hindsii
Oregon Ash	Fraxinus latifolia
Locust	Robinia pseudo-acacia
Tree of Heaven	Ailanthus altissima
Elderberry	Sambucus mexicana
Blackberry	Rubus vitifolius
White Alder	Alnus rhombifolia
Wild Grape	Vitus californica
Wild Cucumber	Marah fabaceus
Red Berry	Rhamnus crocea
Coffee Berry	Rhamnus californica

d. Freshwater Marsh: The marsh produces no canopy of its own but trees of other vegetation types may be found along the perimeter. Any place where water stands and collects on the ground surface is sufficient to attract plant species typical of these "wetlands". Only a specific group of plants thrive under these abnormally wet conditions, and species of other vegetative types are totally excluded. Thus, a very distinct unit is formed. Cattails, rush and sedge are typically found on the rich, moist organic soils along the peripheries, and the deeper water is commonly covered by the attractive water primrose.

These sedate wet areas are attractive to many animals, some of which depend on the aquatic medium to support one or more of their life cycles. Amphibians, such as frogs, toads and some salamanders, lay their eggs in the quiet marsh waters, hatching into fully aquatic larva before the air-breathing adult stage emerges. Water, being a basic requirement of life, naturally attracts the more terrestrial vertebrates which either feed upon the vegetation or on the other creatures that abound here. Species of warmwater fish exist here naturally while others have formed viable populations after artificial stocking. Basic to the food web* are the numerous invertebrates. These include many types of insects, worms, snails and leeches.

Included among the typical flora are the following:

Common Cattail	Typha latifolis
Sedge	Cyperus vegetus
Common Scouring Rush	Equisetum arvense
Water Primrose	Jussiaea repens
Beard Grass	Polypogyon monspeliensis
Joint Grass	Pasplum distichum

e. Oak-Grassland: Oak-Grassland, as indicated by its name, is the transition (or ecotone) between Oak Woodland and Grassland; many elements of each, both biological and physical are represented. Where topography and soil moisture conditions are unsuitable for a solid stand of oaks, a less dense canopy is formed. Grassland species such as ripgut, wild oats, foxtail brome and a host of assorted forbs replace the moisture and shade-dependent vines and shrubs. Botanically, the Oak-Grassland is the most diverse unit along the River.

In spite of the physical similarities, some species of plants and animals are found exclusively in this ecotone. Species such as poison oak and the California polypody

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* The network of plant and animals that feed and are fed upon by each other.

(fern) are unable to withstand the aridity of the Grassland and the dense crowding and competition of the Oak Woodland but thrive in the transition.

Flora found in the Oak-Grassland transition include the following:

Interior Live Oak	Quercus wislizenii
Blue Oak	Quercus douglassii
Valley Oak	Quercus lobata
Wild Oats	Avenua fatua
Ripgut	Bromus rigidus
Star Thistle	Centaurea solstitialis
Soft Chess	Bromus molis
Foxtail Brome	Bromus rubens
Foxtail Fescue	Festuca megalura
Annual Bluegrass	Poa annua
Brodiaea	Brodiaea Laxa Brodiaea pulchella
Poison Oak	Rhus diversiloba
California Fuchsia	Zauschneria californica
Dutchman's Pipe	Aristolochia californica
Mexican Tea	Chenopodium ambrosioides
Coyote Brush	Baccharis pilularis
Horehound	Marrubium vulgare
Vervain	Verbena bonariensis
Pennyroyle	Mentha pulegium
Vetch – two species	Vicia angustifolia Vicia dasycarpa
Tarweed	Hemizonia virgata
Red Berry	Rhamnus crocea
Coffee Berry	Rhamnus californica
Bedstraw – two species	Galium aparine Golium nutallii
Filaree – three species	Erodium cicutarium Erodium botrys Erodium moschatum

Oak-Grassland Flora (Continued)

Mustard – three species	Brassica campestris Sisymbrium officinale Brassica geniculata
Buckwheat	Eriogonum sp.
Plantain	Plantago lanceolata
Shooting Star	Dodecatheon hendersonii
Buttercup	Ranunculus californica
Larkspur	Delphinium sp.
Curly Dock	Rumex crispus
Evening Primrose	Oenothera hookeri
Western Ragweed	Ambrosia psilostachya
Locust	Robinia pseudo-acacia
Oracle Oak	Quercus morehus
Prickly Lettuce	Lactuca seriola
Rock Lettuce	Dudleya cymosa
Soap Plant	Chlorogalum pomeridianum
California Polypody (fern)	Polypodium californicum
Maiden Hair Fern	Adiantum jordanii
Golden Back Fern	Ptiogramma triangularis

f. Shrub-Grassland: Shrub-Grassland is the area of convergence between Grassland and Riparian. The most obvious plant is willow, but coyote brush and California brickellia are also scattered along the sandy reaches. This zone is found within the River's flood plain; willows are limited in distribution to where its roots can reach river seepage. Like the Oak-Grassland transition, as available river-water seepage decreases, so does the composition and vigor of this vegetation type. A more open canopy is thus formed. The increase in sunlight and greater development of soil allows Grassland plants to replace the usually herbaceous understory.

Typical flora include the following:

Willow – three species	Salix lasiolepis Salix hindsiana Salix laevigata
Coyote Brush	Baccharis pilularis
California brickellia	Brickelia californica

Deer Weed	Lotus scoparius
Mustard – three species	Brassica campestris Sisymbrium officinale Brassica geniculata
Penstemon – two species	Penstemon heterophyllus Penstemon breviflorus
Mexican Tea	Chenopodium ambrosioides
Valley Oak	Quercus lobata
Wild Oats	Avena fatua
Ripgut Grass	Bromus rigidus
Soft Chess	Bromus mollis
Foxtail Brome	Bromus rubens
Sweet Anise	Foeniculum vulgare
Tree of Heaven	Ailanthus altissima
Tarweed	Hemizonia virgata

g. Other land classifications: There are several additional land classifications that occur because of man's activities. These areas are either without vegetation or with vegetation modified by cultivation.

Cropland includes all areas under current or past cultivation with at least some remnant of the crop.

Cultivated Grass includes all areas of lawns in parks and recreation areas. This would usually imply irrigation.

Development Land includes all areas of building development, either existing or under construction.

Parking Lots and Roadways includes all of the paved areas and the cleared rights-of-way.

Tailings include all areas of dredger disposal with less than 50 percent ground cover.

2. Wildlife

The American River floodplain provides important habitat to a large number of mammals, birds, reptiles, amphibians, fish and assorted invertebrates. The Oak-Woodland and Grassland peripheries are also inhabited by a variety of animal species. All of these creatures play a significant role in the ecology of the American River Parkway.

One of the truly unique aspects of the River is the proximity of its naturalistic "greenbelt" to a highly urbanized area. The many animals living here do so is an interesting ecological situation, which is pertinent to the maintenance of the Parkway's "naturalistic" concept. As previously mentioned, vegetation is more or less restricted by a number of environmental factors. Features such as rainfall, groundwater, soils, aspect and the biologic factors such as competition and grazing tend to dictate the distribution and abundance of vegetation. There is a very distinct interrelationship between animal species and their habitat. Fauna is constrained by flora as flora is confined by physical features. While physical elements do play a role with animals, the animal diversity is more directly responsive to vegetation.

The presence of cover for shelter and certain plants for food are initially attractive to many animals. These creatures form the base of the food web. Carnivores, from the tiny voracious shrew to the endangered bald eagle, prey upon the smaller animals, keeping a check on their populations and hence, preventing them from devouring the habitat.

The environmental tolerances that an animal will withstand are displayed by its range of accepted habitat. Because some species have relatively broad food cover tolerances, they can adjust to a variety of vegetal types. On the other hand, some cannot adapt to even a slight change in their habitat, much less its total elimination. On the far end of the spectrum lie the most sensitive animals -- those that cannot tolerate even the mere presence of man, or any other introduced competitor. The reduction or modification of home ranges and niches, as accomplished by man-induced noises, road building and urbanization, helps to account for the disappearance of many species that were once common on the River.

Any wildlife living along the Parkway today has clearly demonstrated its ability to adjust to man's presence and disturbances. The vegetation has been described as being extremely disrupted and transitional, both regionally and locally. Animals living here have adapted to this turmoil; many actually thrive on it.

a. Birds: The Belted Kingfisher is a good example of a bird that has adjusted to a seemingly inhospitable situation. These fish-eaters nest in the river banks and despite annual flooding, fluctuation in water levels and subsequent erosion a recent survey indicated a larger population of these birds than noted in the past. Upstream flood control projects, which help to regulate flows, may help account for the increase.

Large colonies of bank and cliff swallows nest on the towering river bluffs and under bridges. They provide an interesting spectacle for the streamside naturalist.

Many valley quail and ring-necked pheasants are found in the thickets of Oak-Woodland and Riparian understory. Blackberry and other fruit-bearing plants are a favorite cover for these birds as well as a myriad of other wildlife. This habitat is significant not only in itself but in its edges, that is, where the heavy undergrowth meets open ground.

A bird of questionable status, the yellow-billed cuckoo, is known to inhabit a riparian zone on the Sacramento River that is very similar to that of the American. It is not known if any of these secretive birds are present, but the possibility does exist.

The Sacramento region is known to be a key stronghold for the white-tailed kite. They can be frequently seen hunting over Grassland and Oak-Grassland. Other raptors are common, especially the red-tailed and sparrow hawks. Even an occasional bald eagle or osprey have been reported in recent years.

Wood ducks are present year-round in small numbers, while mallards, mergansers, grebes and other waterfowl are more common. An occasional migratory goose stops here on his long annual flight. Shorebirds such as killdeer and the spotted sandpiper find attractive habitat along the beaches and sandbars of the Riparian zone.

Many species of passerines, from warblers to sparrows, are counted every year by the Audubon Society's "Christmas Count". Many specific habitat requirements for these small song birds, whether it be for nesting, feeding or resting, are fulfilled within the six vegetative types.

b. Mammals: Most of the mammals found along the Parkway are not limited to a particular vegetative type but can be found in a variety of habitats. As would be expected, rodents are attracted to the many niches provided by the constantly changing vegetation of disturbed sites. Ground squirrels, gophers, rabbits, wood rats, field mice, and the urban spill-over of house mice and rats occupy the terrestrial environment, while eastern fox squirrels and western gray squirrels enjoy the food and safety advantages of life in the wooded areas. The abundance of herbivorous animals attract a variety of predators, including gray fox, raccooon, coyote, bobcat, long-tailed weasel and striped skunk. These, along with flesh-eating birds, reptiles and fish, aid the natural selection process in controlling the small mammal population.

Black-tailed deer are still found along the Parkway, a remnant of the large number of hooved animals that were once found throughout the entire region. There have also been reports of red fox on occasion. Although the ring-tailed cat's range lies primarily within the Sierra foothills, individuals are known to stray onto Parkway lands from time to time. Aquatic fur-bearers such as beaver, muskrat and possibly river otter and mink inhabit the Riparian and Freshwater Marsh zones. Both beaver and muskrat are surprisingly common along the cattail sloughs and backwater.

c. Reptiles and amphibians: The western fence lizard, the most commonly occurring reptile of the Parkway, is more likely to be heard retreating through the underbrush than actually seen. The colorful gopher snake is one of its many enemies, as are most carnivorous snakes. Western racers and California king snakes may be encountered, but usually they have disappeared long before identification can be made. The rare striped racer is also known to inhabit the Parkway. Where most snakes and lizards are found in a variety of cover types, the turtles are more specific. Pond turtles and desert tortoises are, of course, found in Freshwater Marsh and Grassland respectively, while the box turtle frequents a broader range in his quest for grasshoppers, worms and grubs.

Except for the toads, most amphibians must maintain a moist skin surface in order to breathe. Newts, bullfrogs and tree frogs spend most of their life in or near water, while the rare, slender and arboreal salamanders obtain their moisture under woodland logs and debris.

d. Invertebrates: The importance of invertebrates to an ecosystem should never be underestimated. This complex of backboneless creatures form an integral portion of the food web. Without food base organisms such as insects, the primary carnivores* such as fish, frogs, and many secondary carnivores** such as ospreys and garter snakes could not exist within the ecosystem.

Most of the invertebrates encountered by Parkway users are regarded as pests. Ground-dwelling hornets and yellowjackets commonly make their presence known to picnickers, although, being relatively passive, do not pose a problem unless they are physically threatened. Deer flies, on the other hand, are aggressive and will seek out a meal of mammalian blood, including human blood. Fungus gnats, valley black gnats and buffalo gnats are abundant along the River. They are considered to be pests due to their large numbers as well as their irritating bites. Mosquitoes are undoubtedly the most notorious nuisance insect, especially in the spring when hordes of these bloodsuckers descend upon the Parkway. The most common forms are the "tree-hole" and "flood-water" mosquitoes, named to describe their breeding sites.

Not all insects are pests. Parkway lands are host to the pipevine swallow-tail butterfly which breeds only on the plant for which it was named, and thus specific to the Oak-Woodland vegetation type. Ants, grasshoppers and crickets are common throughout the region, while the uniquely beautiful dragonfly and damselfly are as typical to the aquatic environment as the marsh and

3. Parkway Ecology — South Bank

A large expanse of dredger tailings extends from Hazel Avenue to Sunrise Avenue. There are some depressions which catch rainwater and which support cottonwood, willow, oak and assorted shrub growth. Patches of grasses and forbs occasionally take root on the infrequent pockets of soil between the rock, but this is essentially a sterile area. The and and gravel works is also almost devoid

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* Those animals which feed directly on herbivores.

** Those animals which feed directly on primary carnivores.

of plant life. Along the river bank typical riparian cottonwood, willow, alder and ash are replaced by oak and assorted shrubs on the higher ground less affected by the River.

Just below the Sunrise Boulevard Bridge is a large open field, and between this grassland and the River a freshwater marsh pond has been formed by wastewater from the sand and gravel works. Fine silts and clays are suspended in the water and have built up a five-foot deep mud bottom. Even with such an adverse environment, typical marsh plants grow profusely in the area and herons have been sighted.

East of the marsh is Upper Sunrise Park, an undefined area covered by dense Riparian vegetation. Just west of the marsh is the border of Lower Sunrise Park. It consists of a large area of sod surrounded by an open grove of tree of heaven, walnut, cottonwood and willow, with gradual transition from open Oak-Grassland to dense Oak-Woodland downstream.

Rossmoor Bar, located just downstream, has been severely eroded in the past. Judging from the number of roads and other bare, trampled ground, it appears that there has been a great deal of off-the-road vehicle use in the recent past. Dredger tailings are common also, but in contrast to other tailings, a relatively rich growth of vegetation is apparent. Large expanses of Shrub-Grassland support lush growths of five-foot willows, while cottonwood and tree of heaven are scattered over the remainder of the bar. A large pear orchard stretches from the western part of Rossmoor bar to Goethe Park. The orchard is bisected on the River by a quarter-mile wedge of the Cordova Community Park. Significant natural vegetation is not found along this reach of the River except for a narrow strip at the water's edge.

Goethe Park is located on the next downstream bar. A fine representative growth of Oak-Grassland here is bordered on the River by a transition to Riparian. The ground is covered by a very dense stand of grass except on numerous disturbed sites. Motorcycle use has been rampant in the recent past, and the consequential degradation of the vegetation is extreme in many areas. Valley oak, interior live oak, tree of heaven, California black walnut and cottonwood are all very common.

Dense groves of locust, walnut and elderberry cover the River's bank down to Watt Avenue. Levees border both sides of the River from Rio Americana High School downstream to the mouth, but most of the remaining vegetation within the levees is very similar to that just described. Except for the last major bar, Paradise Beach, most of the streamside is much alike, with a grassy levee and transition to oak, cottonwood, willow, alder, ash and tree of heaven. Paradise Beach is largely bare ground with interspersed shrubs and some riparian habitat.

Just downstream from the I-80 Bridge, a large depressed section of land is located, which was formerly under cultivation. It is bordered on all sides by levees, and the city dump is located on the southwestern edge. There is a narrow riparian habitat on the south bank from I-80 to the Jibboom Street Bridge.

4. Parkway Ecology – North Bank

Immediately adjacent to Nimbus Dam, the River is bordered by a very steep hillside covered with Oak-Grassland vegetation. More to the north, benchland is found, containing a network of wooded ravines. This entire area from the dam to Sailor Bar is characterized by Oak-Grassland plantlife with interspersed Oak-Woodland in the gullies. This is an important wildlife area, owing to the large expanse of undeveloped land and the diversity of habitat. Also, the high fire potential in this grassy area is significant owing to the popularity of its riding trails.

Sailor Bar is heavily used by rafters and canoeists as a launch site. The entire bar is covered by dredge tailings and most of the vegetative units are poorly defined. Inland, roads and large bare areas are scattered among patches of oak. The vegetation ranges from Oak-Grassland to Shrub-Grassland to Grassland to Riparian as the River is approached.

Bluffs rising as much as 100 feet above the River border the north side of the River from Sailor Bar to Sacramento Bar. The latter has the remnants of dredger pits which have become marshes and ponds, giving the area a unique naturalistic setting, and attracting a large number of animals.

Another section of bluffs extend from Sacramento Bar down to Ancil Hoffman Park, providing the homes for a large colony of cliff swallows, as well as a variety of exotic plants from private homes. A number of small, heavily wooded draws drain

into the River along this section of bluffs. The Oak-Woodland habitat is important to the wildlife, as it is in the other wooded areas.

Ancil Hoffman Park is bordered by barren sandbars along the River and includes an 18-hole golf course, which covers much of its area. Small segments of Oak-Grassland and Shrub-Grassland exist on the remainder of the bar and a designated nature area contains Oak-Woodland. Private homes have been built along lower bluffs downstream from the Park.

Adjacent to Arden Rapids is Arden Bar. A large dredger pond, an active sand and gravel operation, and a sewage treatment plant are the most notable aspects of this major bar. The vegetation along the pond is very similar to that on Sacramento Bar.

The area from Rio Americano High School downstream to opposite Paradise Beach is essentially homogeneous. Again, a grass-covered levee gradually merges with the Riparian growth by the River. From Cal-Expo to Discovery Park a broad band of grassland separates the levee from the River, with typical Riparian vegetation at the River edge and along the borrow pit next to the levee. Much of the open Grassland here has been or is currently being farmed. Discing at least once per year and seeding with dry land crops seems to have markedly reduced the star thistle and other 'undesirable' invader species. The farmer has had little success, however, in making a profit on his operation.

Discovery Park, the extreme western segment of the Parkway, has a large Oak-Woodland section used as an archery range. Most of the remainder consists of sod grasses and parking facilities.

5. Pesticides and Herbicides

The Sacramento County Parks and Recreation Department administers control chemicals on the Parkway in accordance with specific recommendations of the County Agricultural Committee who is responsible for ensuring compliance with Federal and State laws and regulations.

a. Pesticides: The Sacramento County Department of Parks and Recreation uses pesticides for control of parasitic moths and ground-dwelling hornets, and for eradication of ground squirrels that invade sod areas. Malathion is used on a selective basis for the moths and hornets and poison gas bombs are used on the ground squirrels.

The Yolo-Sacramento County Mosquito Abatement District treats mosquito problems on a "by-request" basis. They employ a five-part program using biological means in preference to chemical means:

1. Source control of mosquito habitat.
2. Biological control with the use of mosquito fish (feed on mosquito larva).
3. Larvacide oil application which coats and asphyxiates larva.
4. Organic phosphate application in highly organic water, where the larvacide oil is ineffective.
5. Organothiocynate occasionally as a last resort.

b. Herbicides: The Department uses herbicides for several purposes. The eradication of obstructive broad-leaf plants is accomplished through the use of Princep 80^{W} (for immature plants) and Amino Trizole (for mature plants). These two chemicals are sprayed on two-foot strips on either side of the American River Parkway bike trail in the spring. Spot applications of 2-4D are made during the remainder of the year as any problems arise.

Sod areas are sprayed with 2-4D during the spring and fall. Dacthal 75^{W} is administered to control crabgrass. Both crabgrass and joint grass are sprayed with "MSMA" in three applications, 10 to 14 days apart, in late summer.

A fungus control chemical is used on grass and on cultivated trees and shrubs as the need arises.

6. Nature Versus Recreation

With the biological setting of the American River Parkway in mind, it is appropriate to discuss how the biotic communities can best be managed so that nature and recreation can effectively harmonize with one another. These two elements are not

mutually exclusive although some tradeoffs will be necessary. With the objective of using the area to fulfill recreational needs and, at the same time, preserve the River's "naturalistic" environment, we must work within the framework as manifested by the tolerances of the biota. Therefore, it is necessary to examine the delicate balances between the constituents of the ecosystem and how the development of recreation in the Parkway can affect them. Because every relationship, or balance, is not delicate to the same degree, only those critical to the maintenance of the overall appearance or protection of individual species need be explained. Then, using the homogenous breakdown of life into communities developed in the discussion of vegetation, in Section 2.0, the suitabilities to various human activities can be defined and potential conflicts can be identified.

a. Sensitivities: Compaction and abrasion by vehicles and trampling by feet will damage all types of vegetation and loss of vegetation in turn affects the wildlife. Vegetative loss also reduces scenic values and may impair the desirability for recreational uses. Damage to some vegetative units and in some areas is more serious than others.

Oak-Woodland, Freshwater Marsh and the densely vegetated parts of Riparian zones are the most valuable areas in terms of their importance to both human esthetics and wildlife habitat. The properties that make them desirable can best be maintained by curtailing intense human activity within the immediate area. In other words, these areas need to be buffered from human activity to whatever degree possible and practical. This is especially true for Marsh and Woodland areas.

While the physical invasion by man is most detrimental, noise impacts of his activities must not be overlooked, but this is probably more disagreeable to the naturalist than to the biota. The solution to this problem is a buffering zone.

Loss of vegetation from the land surface can also lead to erosion, so both foot and vehicle traffic should be kept away from areas susceptible to erosion. This includes steep hillsides, gully bottoms where storm drainage flows occur, and banks subjected to river flows.

Use of any kind in Oak-Woodland or dense Riparian vegetation is especially undesirable because of its high value as wildlife sanctuary. Control of traffic is necessary to minimize impact.

b. Oak-Woodland suitability: The most outstanding characteristic of Oak-Woodland is its unusually dense understory and resistance to penetration. Wildlife is naturally attracted to its wealth of food and protective shelter. However, its desirability as a recreation zone is questionable. Although many animals may be present, the dense cover provided by shrubs and vines allows most of them to go unseen, thus limiting the potential for nature study or enjoyment of wildlife.

Human activities will not be especially undesirable if there is a moderate buffer zone provided next to the Oak-Woodland, and wildlife can be observed as it moves and feeds around the edges.

c. Grassland suitability: There is usually a direct relationship between the diversity of the flora and fauna. A limited number of annual plants grow in a grassland and thus supports a comparatively small number of animal species.

These annual grasses and forbs are often restrictive to foot travel, which might suggest the usefulness of some grassland for natural barriers. Any reduction of the need for man-made barriers will help approach the ideal of naturalism in the Parkway. The use of this vegetation for such a barrier would probably often involve little more than blocking existing pathways until they grow over.

Grassland might also be useful for auto parking if the ground cover was removed; however, the lack of shade in an area noted for its torrid summers might negate some of its advantages.

During the hot, dry Sacramento summers, the grass quickly dries, turning from green into a fire hazard. Recreational developments might best be kept apart from such an area when possible. Where use of these areas is necessary, the possibility of irrigation should be considered.

d. Riparian suitability: The Riparian zone is most resistant to disturbance. The plant life evolved under constant stress from flooding and thus possesses the innate resiliance so important when subjected to heavy human use. The dense canopies of cottonwood for shade and bare ground provide a distinct potential for semi-private, scattered recreational niches. Improvements in the form of bermuda grass plantings might also enhance carrying capacity as well provide for dispersal.

Ground cover is important to wildlife and to the esthetics of the riverside, especially when it takes the form of thick, lush growth. Motor vehicles are totally incompatible with these resources from the standpoint of scarification, erosion and noise. There are few that would argue that the Riparian zone is indeed attractive; any measure taken to protect its natural beauty is desirable. One such measure is the erection of short, unobtrusive cable barriers. They would allow pedestrians to pass, prevent motor vehicle trespass, and require little maintenance.

e. Marsh suitability: Marshland is a natural center of life in the Parkway. It is inhabited or visited by many different species of plants and animals who are attracted by the abundance of water and rich organic soils. Almost the entire spectrum of natural life forms, from food-base herbivores to carnivorous vertebrates, are attracted to it. The configuration of the vegetation, unlike Oak-Woodland, provides many opportunities to view wild creatures in their natural environment. Except for the more secretive rails and nocturnal foragers, wildlife can be often found in the open by the observant naturalist. The advantages of this zone as a designated natural area are readily apparent, but limiting foot access to specific trails is highly advisable. This could be accomplished with a minimum of supervision or restriction by providing one good trail circuit provided with an information sign system.

The buffering of this vegetative unit is important if maximum benefit is to be obtained from this recreation use.

Some marsh ponds are better suited for fishing than nature study. When ponds are deep and without considerable peripheral vegetation this alternative might be more appropriate. Other recreational uses are generally incompatible with the resources.

f. Transition zone suitability: Oak-Grassland and Shrub-Grassland provide natural buffering for some vegetation types that require some degree of isolation, such as Oak-Woodland. However, the plants and animals found here are an important resource in themselves.

These areas are generally rather resistant to damage and able to recover well, but there may be unique sites, such as nesting areas, where isolation or protection is desirable.

Star thistle and ripgut are common as ground cover, thus decreasing the potential for recreational sites. Horse and foot paths are presently located through these open woodlands and this intermittent use seems compatible with the resident biota.

7. Slopes

The Parkway includes a range of conditions varying from large areas of essentially flat land to nearly vertical cliffs. Below Arden Bar, the River is bordered by levees, with slopes typically from 30 to 50 percent. From Arden Bar upstream, the slopes are highly variable.

Slope is one of the factors that must be considered in determining land use suitability. The maximum allowable slope for any particular use is not a precise figure, but the areas of the Parkway have been divided into three categories for guidance purposes.

Lands with less than 10 percent slopes are generally suitable for most purposes, providing that other factors are favorable. Where slopes are from 10 to 30 percent, land uses should be considerably restricted. These areas will generally not be suitable for structures or for group recreation activities. Vehicle tracks and foot trails are very apt to cause erosion, particularly in the steep end of this range.

Slopes above 30 percent are generally unsuitable for any structures or human activity, and should be maintained in the natural state wherever possible.

8. Erosion

Erosion is a natural occurrence and is inevitable on any river system but is more apparent on a meandering stream such as the American River. There are three types of erosion to be found in the American River Parkway.

One type of erosion is found at steep banks and cliffs which are at the river edge during normal flows. This cutting is usually slow, but may be accelerated during flood flows. This type of erosion can be prevented or retarded by protective measures, but the cost is high and the protective materials may not be esthetically desirable. Protection should only be considered in particularly critical cases; in most instances it will be better to accept the erosion and plan the land uses accordingly.

A second type of erosion occurs during floods on lands away from the River at normal flows. Major changes in the River have resulted from this type of erosion in the past; for example, at Goethe Park and Arden Rapids. Control of such erosion would require major works such as levees, and would not be justified in most cases. Land use in areas subject to flooding should be limited to prevent loss of vegetation and consequent increase of erosion, and any facilities placed in these areas should be designed to be floodable.

The final type of erosion is due to vehicle and foot traffic, either by direct abrasion or by elimination of vegetation and

subsequent water erosion. This type of damage can and should be controlled by elimination of damaging uses from critical areas.

9. Floods

The maximum probable flood flow in the American River below Folsom Dam is established essentially by the operation procedures at the dam. The operating rules allow discharges up to 115,000 cubic feet per second (cfs). The only case in which this flow would be exceeded would be if a tremendous flood would occur which completely exceeded the regulating capacity of Folsom Reservoir. Such an occurrence has a very remote probability.

Calculations by the U. S. Army Corps of Engineers indicate that a release of 115,000 cfs will be required on an average of once in about 10 years with 1973 conditions. If Auburn Dam is constructed, the maximum release will still be 115,000 cfs, but the probable frequency will be reduced to much less than once in 100 years.

The Corps also concluded that flows of about 10,000 cfs will occur on an average of once every year, 30,000 cfs once in two years, and 75,000 cfs once in five years.

10. Archaeology

Encroaching urbanization, increased need for recreational lands, deliberate vandalism, and uneducated curiosity are today eroding the valuable archaeological resources of California. These resources are non-renewable, each one unique in its content of information on past human ecology. Once interpreted, the information each site contains affords valuable keys to land use and cultural adaptation of the former inhabitants.

Although archaeological surveys and some excavations have been done along the American River in the past, records are too incomplete to give a proper assessment of the resources still present. Those sites which have been recorded by other surveys may no longer be completely intact and, in fact, may have been totally destroyed. Others may be endangered and in need of protection from vandalism or future encroachment. Still others may exist that were previously unknown.

Ethnographically, the American River drainage system was thought to be within the territory of the Valley Nisenan or Southern Maidu people. This linguistic group belongs to the larger language family of Penutian speakers who once held the Central Valley and foothills to the north and south as well as the San Francisco Bay region as far south as Monterey.(Kroeber 1970)

The Maidu had a subsistence system based on exploitation of natural resources. The acorn-based economy was augmented by hunting, fishing and utilization of local shell fish from the river. Permanent villages were located on natural mounds or terraces near the river. Major village centers had as many as 500 persons or more residing in them (Kroeber 1970; Wilson and Towne 1973). Smaller subsidiary villages were scattered along the river banks, sloughs and streams of the surrounding basin.

Trade was a well developed complex wherein the Valley Nisenan engaged in reciprocal exchange with peoples to the east in the Great Basin and the Indians of the sea coast regions to the west.

Boundaries are not well defined and had been subject to frequent population pressures and change in the past. The Miwok territorial border to the south is not well documented and probably had shifted through time. It is known from historical records that the Plains Miwok from southern areas had been encouraged by John Sutter to move into Nisenan lands. Resultant shifts in these populations added to the uncertainty of delineating exact boundaries for the territory of these peoples during recent periods. As the time span is pushed back, there is even less certainty of the placement of cultural boundaries.

a. Method of archaeological assessment: The available maps and records of prehistoric archaeological resources were checked at California State University, Sacramento, archaeological facilities and at the State Department of Parks and Recreation, Cultural Resources Section. Copies were made of site survey forms on existing resources, including the two sites entered in the National Register of Historic Places. Known site locations were plotted onto USGS 7.5 minute topographic maps or onto aerial photographs.

In addition to the above resource investigation, information concerning the cultural evidence of the American River was collected from other archaeologists who have knowledge of this area. These include Ms. Patti Johnson, Mr. William Pritchard, Professor Jerald Johnson, Mr. Norman Wilson, Dr. James Bennyhoff, Mr. Francis Riddell and Mr. William Olson.

The field survey was done in a composite type of approach. Two raft trips were made to give perspective to the relationship between the river and the settlement pattern. Much of the length of the river was walked by a team of two individuals to cross check the area and locate sites. All known archaeological sites were investigated to ascertain present condition and location.

New, previously unrecorded aboriginal sites were recorded and given temporary numbers beginning with EAE-1 to designate the

company initiating the study. The new sites will be given permanent numbers through the State Department of Parks and Recreation numbering system.

b. Archaeological findings: The assessment of the American River Parkway archaeological resources resulted in the location of seven previously unknown aboriginal sites along the river. A temporary accession system beginning with EAE-1 and ending with EAE-7 was utilized.

Four of the previously recorded sites are no longer extant; Sac-32, Sac-40, Sac-192 and Sac-206. One large site, Sac-99, will be virtually destroyed by the planned construction of the Governor's residence, but the California State Legislature has allocated $110,000 to allow a complete investigation. The State of California's concern for the valuable resource data contained within this ancient village site is to be commended.

Four other sites are badly damaged but still contain enough data to warrant preservation. Included are Sac-31, Sac-199, EAE-6 and Sac-159.

The remaining sites have been disturbed but the archaeological deposit in each case retains its integrity. Protection of these resources should be initiated immediately.

Complete descriptions of all the sites involved have been submitted in a separate report to the Department of Parks and Recreation.

c. Protection of archaeological sites: Protection of archaeological sites is an almost insolvable problem. Limited ingress to an area is the first choice since the site can best retain its integrity if it remains undisturbed by human activities, but such a limitation is often hard to achieve. Once a location becomes known, vandalism is hard to prevent.

The planting of grasses, especially natives, will give a protective screening which will obscure the archaeological site. Protection from erosion by both natural forces and human activity will be afforded. River gravels can be transported to the site and used to cover areas that are being vandalized or disturbed by vehicular traffic. If this method is used, some record of the procedure should be kept to permit relocation of the site.

If the site cannot be maintained in its present status, but has to be utilized, the following alternatives can be considered:

- Park grounds with watered grasses to prevent disturbance of the upper strata of the midden site by human use. The grass will also obscure the presence of the site from "pothunters".
- Parking lot use. If fill were used to cover the midden to prevent compaction of the upper levels of the site,

utilization for this purpose is possible. The depth of fill should be adequate to protect the site from disturbance.

- If no other alternative can be found, then excavation should be considered. Although the value judgement is made by the archaeologic community, loss of data is irreversible.

The question has been asked, "Why should we be concerned with archaeological sites, history, interpretation, moral or religious values, or for some other reasons?".

Protection is necessary to insure that future generations may see aboriginal habitation sites and realize that there have been other cultural manifestations here in California.

Future scientists will evolve better sampling and testing procedures unavailable to today's archaeologists. Preservation of sites until these new techniques are formulated will hopefully allow a better interpretation of man's past activities.

d. County responsibility: The scope of the present study does not call for a general policy statement on archaeology or upon its relative value. This type of discussion properly belongs within a report specifically oriented towards the establishment of the County's official stand on the problem of archaeology. However, some discussion of policies and responsibilities of

other agencies, and some recommendations for action by the County are relevant to this Study.

Both the County of Marin and the County of Inyo now have ordinances regulating private and public archaeological resources. These may be referred to as statements of those counties' policies in this area of concern. (See Marin County, California, Ordinance No. 1589, and Inyo County, California, Ordinance No. 146).

Other laws pertaining to protection of archaeological resources are found in the State Antiquities Laws. In addition, Senate Bill No. 246 and Senate Concurrent Resolution No. 43 deal with archaeology.

Presently, there are three archaeological sites extant on Sacramento County lands within the American River Parkway. These are: "The Joe Mound", Sac. 26 (31 within Discovery Park; Sac. 205 on the south bank of the river near Fair Oaks; and EAE-6 at the south end of Sunrise Bridge. The remainder of the sites were included since they were located within boundaries of the master plan. Further discussion of these privately-owned sites in

relationship to the overall plan is not within the scope of an archaeologist. If these sites were incorporated into public domain, the knowledge of their location would be of importance at that time.

Preservation of archaeological sites and protection of these from disturbance is based upon the premise that they are non-renewable resources. The disturbance of them destroys part or all of the cultural record. Since no written documents exist concerning these periods of California's past, the archaeological sites provide the only source of information on human occupation prior to the historic era. Written data obtained after Euro-American settlement are extremely incomplete in most instances, thus the archaeological sites constitute a major repository of as yet untapped material.

The three county sites are recommended for protection from <u>further human ingress</u>. Continued use will eventually reveal cultural materials and can result in uncontrolled "pothunting" with further destruction. No fencing or other marking should be attempted since it is known from previous experience that such devices serve to advertise a site location rather than to protect it.

Funding from sources outside the County is unlikely at the present time or in the near future.

Several methods for preserving archaeological sites have been proposed elsewhere in this report. The choice of these should be determined by the planners in consultation with professional archaeologists.

Without testing beyond the survey, no assessment can be attempted as to the value of one site over another in regard to preservation. Only test excavations can reveal strata and depth of archaeological sites. This information would be a minimal requirement in the placement of priorities in site protection.

Ancil Hoffman Interpretive Center could well benefit from the use of Indian artifacts if these were presented as teaching tools of the Indian history. A rotating display program is one suggestion, and the California State University - Sacramento could be approached for help.

The County's area of responsibility is viewed as that of caretaker/guardian. The environmental laws are being enforced to regulate the private developers and cause them to regard archaeological resources as valuable aspects of the total environmental picture. If the County does not regard itself as answerable to those same laws, a dichotomy of application of these regulations is established.

11. Historical Sites

In any attempt to assess the historic resources of the American River Parkway, it is necessary to bear in mind the distinction between the American River Parkway and the valley or floodplain of the American River. While there are many sites of historic interest in the flood plain area, there are relatively few within the proposed boundaries of the American River Parkway. Historic resource is defined as any structure or settlement erected or inhabited prior to 1880. Exceptions are made only in the case of a building of notable historical or architectural significance.

The area of the American River Parkway includes portions of the following Mexican land grants:

- El Paso Grant
- Sutter Grant
- Leidesdorf Grant (Also known as the Rancho Rio de los Americanos)

It includes portions of the townships of American, Sutter, Brighton, Center, Granite and Mississippi.

In order to present a clear view of the historical resources of the American River Parkway, this report is divided into two sections. First, a brief mention of known historical communities which existed inside the proposed boundaries of the American River Parkway, but of which no trace exists today and, second,

a listing of those sites of historic value which are existent in the area of the American River Parkway.

a. Former communities: The entire south bank of the American River from a point opposite Discovery Park to the Howe Avenue Bridge contains no historical remains that could be preserved. All traces of early structures and settlements have been obliterated by a combination of flooding, levee construction and recent construction. Also the relocation of the channel of the American River in 1869 caused the destruction of many early sites.

This area held two "paper cities". These were settlements laid out by land speculators but which never developed. The first, Norristown was established in 1850 in the present River Park area and was bounded on the north by the Norris Ferry (approximately 100 yards south of the present H Street Bridge). It failed and was abandoned. Another such community was Brighton - located in the area between US 50 and the City Filtration Plant. This community, laid out in 1849, was abandoned in 1852. All traces of it have been lost as the result of agricultural activities, and the construction of California State University, Sacramento and the filtration plant.

Perhaps the most important and most interesting community located in this area was Hoboken. This short-lived community, located on the northern portion of the campus of California State

University, came into existence as a result of the flood of 1852-3 which made the roads into Sacramento impassible. Hoboken came into being on January 6, 1853, and received freight from four steamboats a day. Over seventy businesses were established and between 1,000-1,500 persons were resident there. The residents went as far as electing their own mayor. The roads dried in February 1853, and the "town was soon abandoned". The site of Hoboken was under cultivation from the 1860's until the construction of California State University and no traces remain.

The north bank of the American River from Discovery Park east to the Howe Avenue Bridge does not appear to have included any "paper cities" or any other sites of historic importance which have been preserved.

b. Existing historic resources: The area between the Howe Avenue Bridge and the Nimbus Dam contains three sites of historic importance. These are Sutter's Grist Mill, a Chinese squatter settlement, and a settlement at Sailor Bar.

Sutter's grist mill was located west of the Sunrise Avenue Bridge on the north bank of the American River. Built in 1847, it was only briefly operated. On the south bank, the site of a Chinese squatter settlement is split by existing asphalt access road to the American River Parkway. This site, which is also the location of a large Indian midden, is marked by a large number of Chinese trees-of-heaven and what appears to

have been the site of an important structure. The surface of the site is littered with fragments of porcelain, china and earthenware - all of Chinese manufacture. The site has been vandalized. There are at least a hundred pits of varying sizes dug by bottle hunters and other vandals. Protection of what remains of the site and/or excavation of the site could yield invaluable data.

The settlement at Sailor Bar was located west of the Hazel Avenue Bridge on the north bank of the American River. The site consists of a number of house foundations - six are visible. These structures could date back to the 1850's. Excavations here could permit the preservation of valuable archaeological data.

c. Sources of information: This report is based on research in the California Collection of the California State Library, materials in the Bancroft Library and a ground survey of the area included in this report. The following sources were used.

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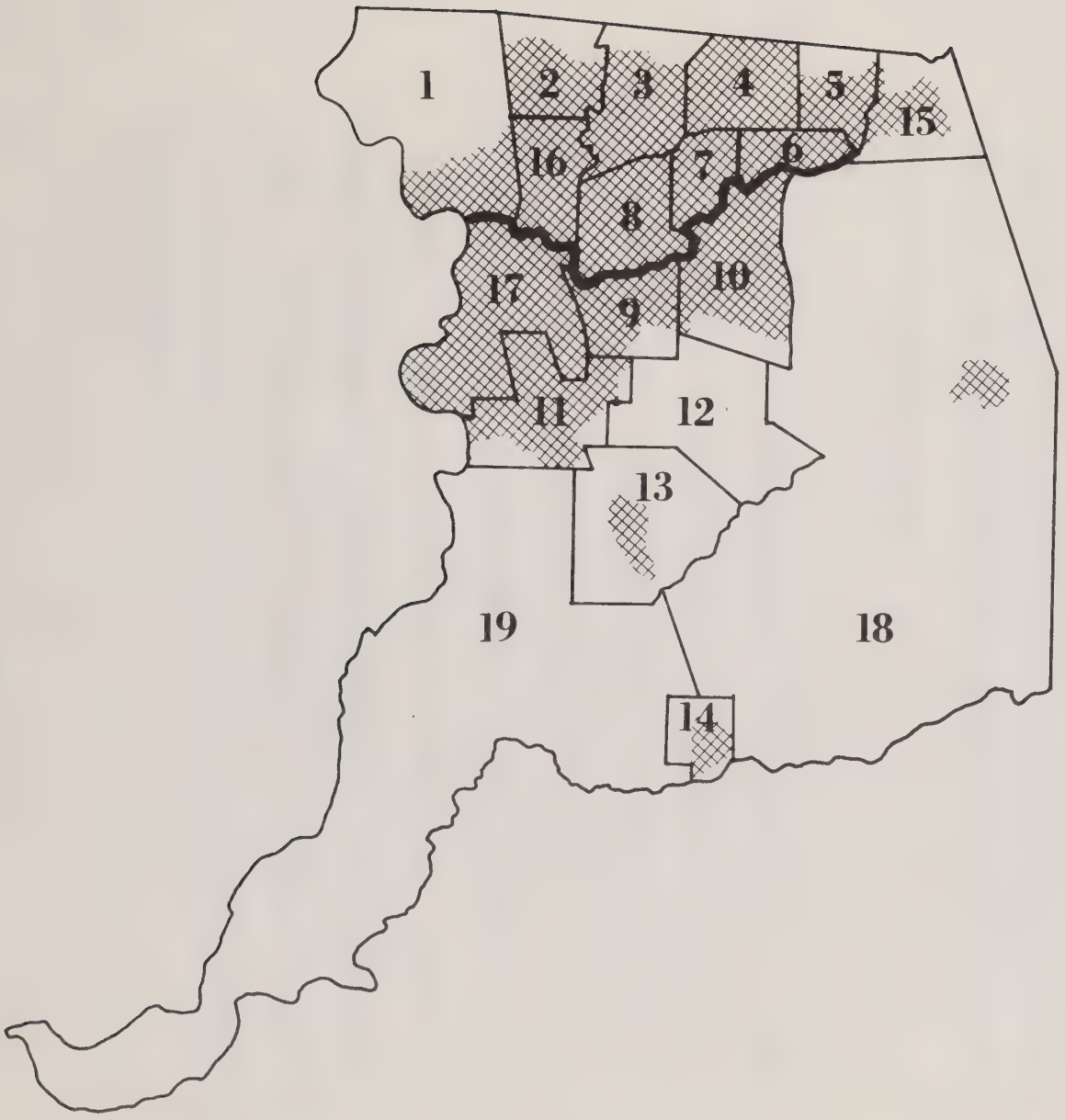
B. MAJOR DEVELOPMENTAL CONDITIONS

1. Introduction

"Developmental conditions" include the social and man-made context of the American River today. Those aspects of development which have an impact on the River are discussed in this section on several levels: first, the regional scale, which is roughly county-wide; secondly, within a corridor defined by the River and extending approximately a quarter of a mile on either side. This immediate area, termed the "developmental study area", is singled out because land use here intimately affects and is affected by the Parkway. Within the developmental study area lies the environmental study boundary which defines the area of concentration for environmental conditions analyses.

Not only does the developmental study cover conditions in 1973, comparing them with the situation at the time when the Parkway was first conceived, but it projects trends and discusses plans for a time period extending to 1980-1990. This information has come primarily from the various levels of government responsible for planning and monitoring development and open space preservation in the Sacramento area: The City and County of Sacramento and the Sacramento Regional Area Planning Commission (SRAPC).



		1970	1990
1	NATOMAS	8759	40520
2	RIO LINDA - ELVERTA	12694	18860
3	NORTH CENTRAL	48403	74770
4	CITRUS HEIGHTS	42032	70920
5	ORANGEVALE	17222	26870
6	FAIR OAKS	15463	26600
7	CARMICHAEL	37625	53730
8	ARDEN - ARCADE	85272	103030
9	WESTERN FOLSOM CORRIDOR	18678	38050
10	CORDOVA	38267	61470
11	SOUTH SACRAMENTO	44203	78280
12	SOUTHEAST CENTRAL	2670	4820
13	ELK GROVE	5717	9830
14	GALT AREA	4371	7380
15	FOLSOM AREA	8189	10000
16	NORTH SACRAMENTO	41763	46180
17	SACRAMENTO CENTRAL	188296	196000
18	FOOTHILL RURAL	4352	7490
19	DELTA RURAL	7532	7160

REGIONAL POPULATION

1990 URBAN AREA

STATISTICAL BOUNDARY

X STATISTICAL AREA

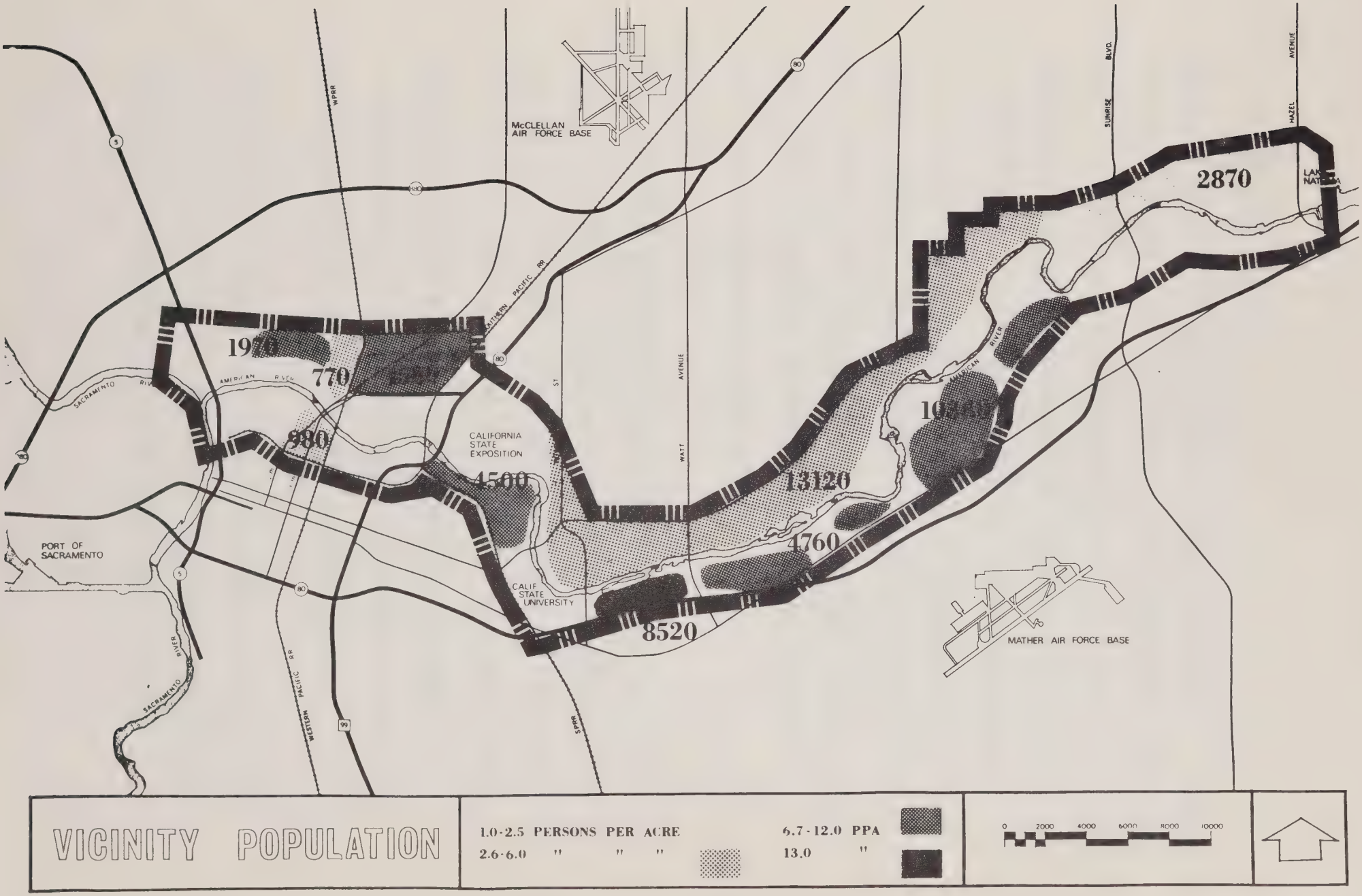
1970 POP. 1990 POP.

2. Regional Context

The American River Parkway is the major open space resource within the rapidly urbanizing northern portion of Sacramento County. In 1968 the metropolitan area, measuring 243 square miles, was approximately 50 percent vacant or agricultural land; by 1980 it is estimated that such land will comprise 27 percent of the metropolitan area. As the Regional Population Map illustrates, the American River Parkway runs through the center of the urban area and is in fact part of a growth corridor extending northeast. Past and projected population increases have been great in areas such as Carmichael and Cordova, which border the River. In addition, extensive growth is anticipated in the portion of Natomas south of I-880 and in Northgate-Gardenland, just north of the American River Parkway.

While County land use planning supports residential growth in the wedge of land between Interstate routes 880-80 and 50, and also between Routes 5 and 99 south of the American River, major expanses of land to the south of the River are recommended for continued agricultural and industrial uses. In part due to the distribution of unique natural areas and in part because of location of available open space, most major regional recreation spots, as defined in the County Open Space Plan, lie in the less populous, southern portion of the County. Within Sacramento City and adjacent unincorporated communities, few regional recreation areas exist or are planned other than those sited along the American River.

Because of its accessibility, the American River Parkway is bound to be in increased demand for recreation activities. Its regional accessibility is enhanced by the growing network of Interstate freeways; for the American River Parkway the opening of I-50, paralleling the river across the County, is still too recent to make its impact felt in terms of traffic volumes and adjacent land use, but its future effect will likely be great.


McCLELLAN AIR FORCE BASE
SUNRISE BLVD.
HAZEL AVENUE
2870
1970
770
980
4500
13120
4760
8520
CALIFORNIA STATE EXPOSITION
PORT OF SACRAMENTO
CALIF STATE UNIVERSITY
MATHER AIR FORCE BASE
SACRAMENTO RIVER
AMERICAN RIVER
WESTERN PACIFIC RR
SOUTHERN PACIFIC RR
WATT AVENUE
VICINITY POPULATION
1.0-2.5 PERSONS PER ACRE
2.6-6.0 " " "
6.7-12.0 PPA
13.0 "
0 2000 4000 6000 8000 10000

3. Vicinity of the American River

a. Population: Between 1960 and 1970 some of the most dramatic growth in the County has occurred adjacent to the American River, mostly outside the City of Sacramento limits. The unincorporated areas bordering the Parkway (including Fair Oaks, Carmichael, Arden-Arcade, and Cordova) recorded almost 112,000 population in 1960, 176,600 in 1970, and are projected for a 78% increase to 224,820 by 1990. Within the City limits most areas adjacent to the American River anticipate a decline in population, with the exception of those portions roughly north and south of the State University (Campus Commons and College Greens) and Natomas lands north of Discovery Park. In Natomas the increase could be dramatic, since these lands are presently in agricultural use.

Within the developmental study area proper the 1970 population was 48,000, with less than half of this number in the City portion. A rough calculation of population per acre of developed land shows considerable range of densities. On the south side of the River highest densities occur in small pockets: Cordova, College Greens, and areas further west within the City. Farther east in the unincorporated County areas near the Parkway, where Parkway lands are most extensive, population declines in both density and absolute figures.

Using the population projections for communities bordering the American River Parkway can be misleading, not only because of the fallibility of projections, but because spatial distribution of population is not jelled, particularly in

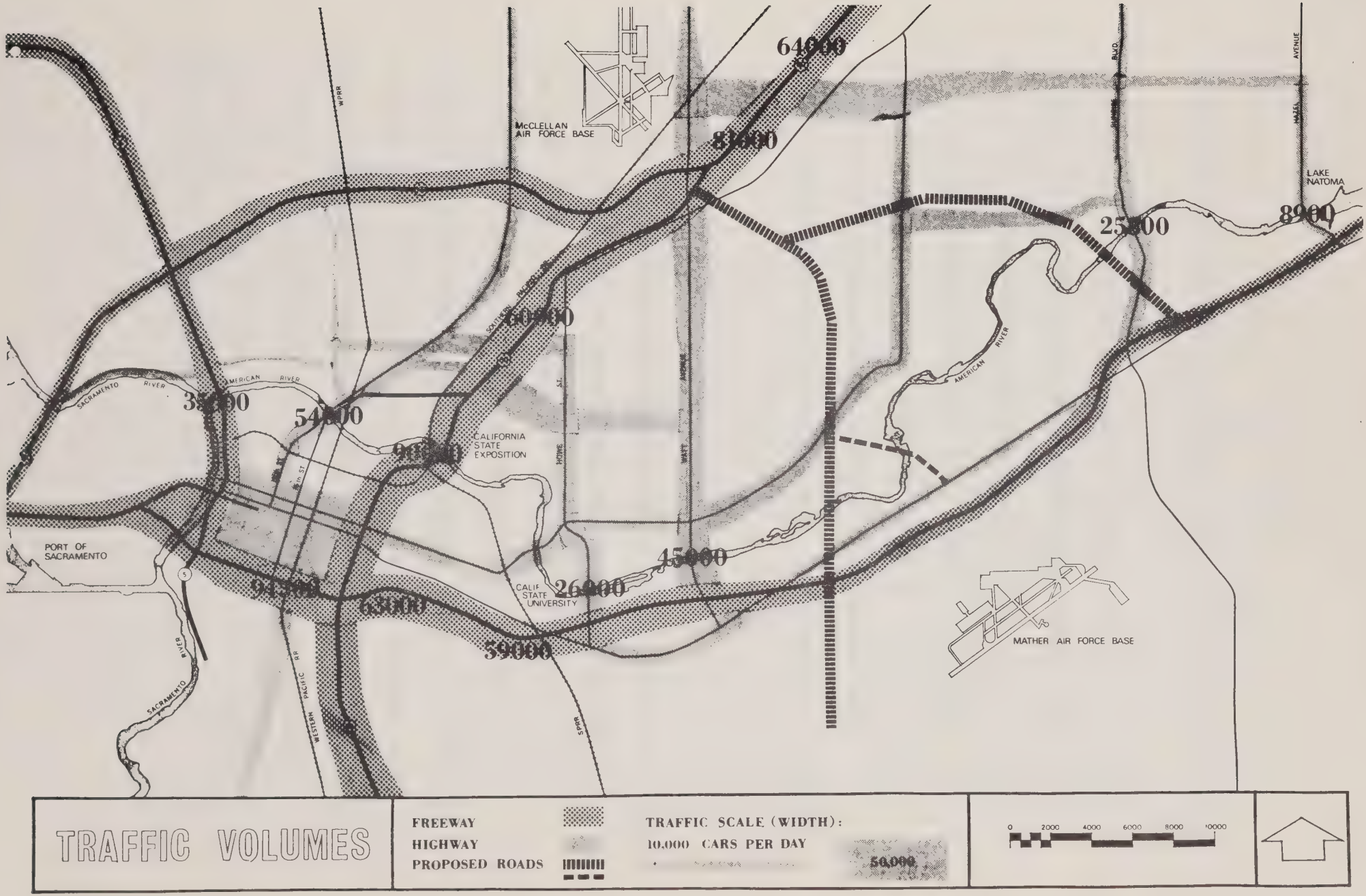
POPULATION

Selected County Statistical Areas Bordering Parkway	1960	1970	Projected 1990
Fair Oaks	9,033	15,463	26,600
Carmichael	20,455	37,625	53,730
Arden-Arcade	64,023	85,272	103,020
Cordova	18,441	38,267	61,470
Natomas	8,896	8,759	36,100
West Folsom Corridor	7,133	18,678	38,050
North Sacramento	49,290	41,763	46,180
Sacramento Central	197,017	188,296	196,000
Foothill Rural	3,213	4,352	7,490
TOTAL	337,501	438,475	568,640
COUNTY TOTAL	502,778	631,498	882,450

Sources: Sacramento County Planning Department; 1960 and 1970 U. S. Census.

unincorporated areas. Beyond setting overall "community" target populations, County planners have a program of community planning which deals much more specifically with desired and appropriate land uses and population distribution within the communities. At the present time community planning programs are underway in Fair Oaks and Carmichael. One issue as yet unresolved is suitable density of residential development adjacent to the American River Parkway. However, several tentative conclusions can be made. Barring any dramatic efforts on the part of the County and City governments to categorically limit density of development within the developmental study area, it is probable that medium density residences (13-30 dwellings per acre) and/or commercial development will occur along major transportation corridors and at key "intersection" nodes (see land use discussion) on both sides of the River. Furthermore, the precedent of higher density residential pockets in Cordova and along Folsom Boulevard on the south side of the River encourages further medium density subdivision of lands designated for residential use in the County General Plan. The presence of US-50 makes large scale residential development virtually inevitable. In general, as the land use section of this report will treat in greater depth, by 1990 almost all major open space adjacent to but outside the American River Parkway will be developed, primarily for residences.

b. Traffic and Circulation: The purpose of this section is to outline traffic patterns and relative volumes along and across the River, to indicate trends, and to clarify implications of this information for the Parkway and its use. Although


TRAFFIC VOLUMES
FREEWAY
HIGHWAY
PROPOSED ROADS
TRAFFIC SCALE (WIDTH):
10,000 CARS PER DAY
50,000
0 2000 4000 6000 8000 10000
McCLELLAN AIR FORCE BASE
MATHER AIR FORCE BASE
CALIFORNIA STATE EXPOSITION
CALIF STATE UNIVERSITY
PORT OF SACRAMENTO
LAKE NATOMA
SACRAMENTO RIVER
AMERICAN RIVER
WESTERN PACIFIC RR
SPRR
WPRR
64000
83000
60000
45000
26000
59000
63000
25000
8900

these data can contribute to an analysis of Parkway access and traffic directly related to Parkway use; detailed discussion will occur in Study Report II.

Lying in the urban and urbanizing sections of Sacramento County, the American River Parkway and bordering lands are subject to traffic trips for which the River is totally incidental--or even a bottleneck. The land use and employment patterns of the Sacramento metropolitan area are such that residential population has spread northeast between I-80 and US-50, roughly, while employment is more concentrated in the City. This necessitates much crossing of the American River, particularly at 80, where rush hour congestion is common.

Within the last year US-50 was opened through to Placerville, and if residential and commercial development proceed along this route as depicted in the County Plan, a growth corridor may be expected. The presence of this route and concomitant land development also increase need and demand for River crossings. The table River Crossing Traffic Volumes illustrates current as well as projected traffic. On the north side of the River the relatively low density of immediately adjacent development and the availability of a network of surface arterials reduces somewhat traffic pressure on a route such as Fair Oaks, which is being planned as a scenic "Goldrush Parkway".[1] A Traffic Volume map illustrates relative street and highway volumes in 1972.

RIVER CROSSING TRAFFIC VOLUMES

CROSSING	1968	1972	PROJECTED 1980* R/S MODEL	PROJECTED 1980* M/N MODEL
I-5	15,400	35,100	73,000	71,000
Route 160	57,790	54,060	60,100	57,800
I-80	88,360	89,550	68,900	71,900
I-80 Bypass	--	--	57,700	53.600
H Street	43,570	35,690	41,200	40,200
Howe Avenue	--	26,100	39,100	37,600
Watt Avenue	31,850	44,750	47,000	30,700
Sunrise Blvd.	17,920	25,780	46,100	35,600
Hazel Avenue	7,220	8,900	21,600	20,100
Prop. 243	--	--	--	43,700
TOTAL	262,110	319,930	454,700	462,200

*Based on Sacramento Area Transportation Study, 1980 Progress Report, Preliminary Draft, March 1972. Projections may be too high for 1980 - more appropriate for 1984. R/S Model assumes no improvements in Northeastern Sacramento County (no 143, 244, or Cordova bridge). M/N Model assumes construction of 143, connecting to I-80 via 244.

In the circulation and roadway plans of the City, County and State are several proposed routes, particularly freeways, which would directly affect the American River Plan. Upon the completion of I-5 south of the Old City, increased crossings of the River at that route can be expected. A bypass of "80" has funding approval and is considered greatly needed in the face of high volumes of traffic in the City portion of that route; the bypass would mean an additional American River crossing. Other new crossings recommended for pre-1990 completion are Routes 143, 244 and a County bridge between Carmichael and Cordova. Route 65, scheduled post-1990, would mean another crossing. These latter are only proposals, however, and have their opponents as well as supporters. Need for, and suitability of, all three is not generally accepted.

c. Land Use: Intensive, urban-type land development adjacent to the American River has a relatively short history. It begins with projects such as Folsom Dam, completed in 1956, which had the effect of providing reasonable flood control along the River. Four years after the completion of the Dam the County took a first step in drawing a demarcation line between protected and developable lands by incorporating a Parkway along the American River in the General Plan. Since that time the importance of that line has grown, as the lands beyond the flood plain turn to more intensive use. Regulating land use within a floodway--roughly, the 115,000 cubic feet per second flood line marks the Parkway reference boundary--is a far easier task than monitoring development immediately adjacent. Securing compatible land uses near and bordering the

the Parkway is a significant issue today.

The development of lands adjacent to the Parkway has a wide variety of impacts on the Parkway--among them contribution to recreation demand and "population pressure" on natural areas, visual and aesthetic effects, depletion of access and vista points, traffic generation and noise--as well as consequences for the overall quality of the physical and social environments. The study area with which the survey of land development outside the Parkway is concerned encompasses almost 14,000 acres, over 4600 of them in the City of Sacramento. The recent survey was made primarily to identify the extent to which lands undeveloped, agricultural, or pasture in 1966 (when a land use survey of the Parkway area was conducted by the County Planning Department) have been put to urban-related uses since that date. The Land Use table records the findings.

In terms of both existing land use and development trends, the City and County unincorporated areas present very different situations. Within the City portion of the developmental study area from the Sacramento River to I-80, roughly, extensive industry is the major use. Farther east are large "public" lands in the form of Cal Expo and the State University. In the City major vacant land planned for residential use occurs only at Natomas and Campus Commons. Of the 1335 acres of vacant or agricultural land turned to developed uses since 1966, 45% (over 600 acres) were in the City, mostly near the

eastern edge of the City limits at Campus Commons and lands between Howe and Watt.

The County portion of the study area is less developed. Here new uses are almost exclusively residential, in the form of massive subdivisions (in the Cordova area and near Rio Americano High School) and spot filling in of lots along the Parkway border by single family residences. Overall, approximately 22% of lands near the Parkway within the developmental study area which were vacant in 1966 had been developed by late 1972.

In planning the future uses of land adjacent to the River, both the City and County anticipate almost complete development in some form of non-open space use. By recommending an intensive industrial area south of the River between the Sacramento and I-80 and north of the River between Route 160 and I-80, the City General Plan implies some filling in of an area now in low intensity industrial use. The County Plan also depicts intensive industry south of the River between Hazel and Sunrise, an area now covered by tailings (extensive industry). According to the County Plan, undeveloped areas elsewhere would be suited to low density residential uses (1-12 dwellings per acre) except along certain transportation corridors and intersection nodes, where medium-density residences (13-30 dwellings per acre) and/or commerce are permitted.

Included in the City and County Open Space and Conservation Plans, which are components of the General Plan, are several recommendations relating to the Parkway: (1) that the Cal Expo grasslands area south of the levee and the Bushy Lake lagoon be designated "natural" areas and (2) that action be taken to preserve the bluffs near Nimbus as part of the River scenic corridor.

LAND DEVELOPMENT[1]

Area	1966 Acres	1966 Percent	1972 Acres	1972 Percent
Total developmental and environmental study areas	20,525	--	20,525	--
Environmental study area (e.s.a.)[2]	6,526	100	6,526	100
Developed	268	4	425	6
Water and Marsh	1,165	18	1,165	18
Undeveloped	5,093	78	4,936	76
Developmental study area (d.s.a.)	13,999	100	13,999	100
Developed	8,532	61	9,710	69
Undeveloped	5,467	39	4,289	31
Total - Uses	20,525		20,525	
Water and marsh	1,165		1,165	
Developed land	8,800		10,135	
Undeveloped land	10,560		9,225	
Vacant, grass, and woodlands	6,899		5,805	
Agriculture and pasture	2,279		2,038	
Sand and gravel	1,382		1,382	

LAND DEVELOPMENT (Continued)

Changes in Use	Acres	Percent
Total land developed 1966 - 1972	1,335	100
Publicly-owned	174	13
Privately-owned	1,161	87
Net agricultural land developed	241	18
Net vacant, grass, woodlands developed	1,094	82
Within city	476	36
In unincorporated areas	859	64
Percent of 1966 d.s.a. undeveloped land which was developed between 1966 - 1972	1,178	22
Percent of 1966 e.s.a. undeveloped land which was developed between 1966 - 1972	157	3

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[1] "Developed land includes residential, commercial, industrial, utilities, roads, public facilities such as parks and other non-vacant or non-agricultural lands. "Water and marsh" and "sand and gravel" were assumed to have no significant change between 1966 and 1972. It is recognized, of course, that such areas fluctuate with River flow levels.

[2] Parkway area within the reference line was 5,435 in 1968.

Sources: Land use surveys from the Sacramento County and City Planning Departments; 1972 aerial photographs of the River area.

AREAS OF PLANNED INTENSIVE DEVELOPMENT

Intensive Use Nodes	Medium Density Residences (13-30 dwellings/acre)	Commerce
Hazel-Winding Way	X	
Sunrise between Fair Oaks Blvd. and Winding Way	X	X
Fair Oaks - Walnut	X	
Fair Oaks - Watt	X	
Fair Oaks through Campus Commons to the River	X	X
Sunrise near proposed I-244 south of the River		X
Northgate - Garden Way		X
Corridors		
Fair Oaks between San Juan - El Camino	X	X
Coloma Road	X	X
Folsom from City to I-65 in Cordova	X	X
Northgate north of Garden Highway		X

4. Regulating Land Use and Development

This section contains a brief inventory of major land use and development controls being used or considered by the City and County for the Parkway and immediate vicinity. The policies by which such regulations are guided are contained in the City and County General Plans. As is usually the case, there is an imperfect fit between plans and implementation, and the effort to refine land use controls which fairly serve the public interest is continual. Recently, particularly, local and County governments in California have been searching for better ways to carry out expanded responsibilities for environmental preservation and open space conservation. Because of issues raised in trying to square development interests and pressures with those of Parkway protection and enhancement as an open space resource, the River area is a focus for new thrusts in land use regulation.

There are actually two types of land use areas in the Parkway and vicinity. For Parkway lands lying within the flood plain, use regulation is achieved by issuing permits, and stringent regulations in the interest of public safety are imposed by several jurisdictions for any development proposed within this flood plain. Lands adjacent to the Parkway flood plain are a much more complicated problem for use controls; the more important of these are listed below.

a. Zoning: State law now requires that by January 1974 there be conformity between the General Plan and zoning in localities and counties. Overall,

Parkway lands meet this requirement already because of their flood plain status. Less consistent is the zoning of adjacent lands. As the land use section of this report noted, the Parkway itself is designated for recreation-open space, while adjacent lands include predominantly residential, with some commercial and industrial uses. Certain zones are considered compatible with "open space" designation. For City zoning categories these include agricultural and flood (F), and the Parkway lands are in the "F" zone.[2] County zones compatible with "open space" are various agricultural zones, a recreation zone (O), commercial-recreation (C-O), planned development (PD), and flood (F) and flood-combining zones. At the time of Parkway Plan approval in 1968, a concerted effort to rezone in conformity with the Plan was not made--nor was it a legal requirement. Consequently, the zones include recreation, low density residential (R-1-A), and agricultural (A-2), all with a flood-combining designation within the floodplain.

For the most part, zoning of lands within the developmental study area but outside the Parkway conforms to uses recommended in the City and County General Plans. The County has a policy of avoiding concentration of commercial recreation uses near waterways, and the zoning pattern along the American River conforms to this policy.

Scenic corridor zoning is in effect for the County portion of the American River. The intent of scenic corridor designation is to preserve visual

attractiveness by limiting placement of signs and advertising within and adjacent to the corridor (if they would be visible from the corridor, ie., the River).

b. Special Performance Criteria for Development: The intent of zoning for areas outside the flood plain is to define basic types of uses and to set standards in terms of density, height of structures, minimum lot size and so forth. What conventional zoning fails to achieve is flexibility. To treat developments on a less standardized basis and to respond to unique surroundings (the Parkway, for example) project design review and other discretionary measures are built into subdivision ordinances and "planned development" designation. Unfortunately, although a significant part of the development occurring near the American River is in the form of subdivisions or planned developments, neither the City nor the County has considered and adopted a set of criteria for evaluating the height, density, visual and other qualities of development along the River. Additionally, the governments could explore ways of expanding the "scenic corridor" concept to create a zone better able to protect the visual qualities of the Parkway.

The process of environmental impact reporting constitutes a form of project evaluation on the basis of performance criteria catering to the uniqueness of a given situation, the intent here being to detail the degree of impact which a proposed public or private project would have on the "physical conditions" of the immediate area and region (including land, air, water, minerals, flora,

fauna, ambient noise, objects of historic or aesthetic significance).

c. Ordinances: Several special ordinances adopted by the County also can have impact on the Parkway and environs. One is the heritage tree ordinance, which protects trees of a defined size. Another, matching statewide legislation to the same purpose, provides that public access to and along public[3] waterways be ensured in all new subdivision developments. One County General Plan recommendation which has not been implemented suggests prohibition of development on grounds of greater than 40% slope.

d. Purchase and Easements: Clearly the most effective control of land use for public purposes comes through public ownership. In an effort to avoid the expense of outright purchase, the 1968 Parkway Plan recommended acquisition of limited public rights to use property: for instance, easements for trails across private land. This "positive easement" strategy--that is, negotiating certain use rights--contrasts with an approach considered more recently: "negative easements". In the latter case, certain uses might be prohibited on private lands due to natural conditions the preservation of which is in the public interest. However, public access is not secured. One promising application of negative easements is in the case of stream channels determined to be floodways[4], some of which may flow into the American River.

e. Building and Development Moratorium: Pending review and revision, as appropriate, of the 1968 American River Parkway Plan, both the City and County are considering placing a moratorium on development within and along the Parkway. In both cases, one purpose of a moratorium would be to allow the government time to up-date general land use plans in the Parkway and vicinity and to adopt, as necessary, revised procedures and criteria for evaluating proposed development along the Parkway. A moratorium would provide for additional discretionary review of projects.

5. Conclusion

It is important to recognize that the relationship between the Parkway--and plans for the Parkway--and developmental conditions, plans, and trends is not the simple one of adjusting the American River Parkway to a fixed set of "future conditions". Today, the Parkway Plan is used by governments and public agencies to review proposed detailed plans and development, to approve or deny proposals, or set special performance standards for the projects in question. Examples include preparation of project environmental impact statements and, in subdivision review, obtaining dedicated public access, overlooks, negotiating easements, and requiring certain design features to protect the visual qualities of the Parkway. This process of fitting development to the policy, design, and use requirements of the Parkway will likely be watched even more closely in the future. It is essential therefore that the Plan address these development aspects in a thorough and informed matter.

Footnotes to Major Developmental Conditions

1. Goldrush Parkway Authority, Goldrush Parkway Plan, January 1972.

2. An exception is land in Cal Expo south of the levee, which is zoned agricultural (A).

3. A public waterway is (a) navigable, (b) declared by the County Board of Supervisors to be a public highway for fishing, or (c) downstream from a State or federal salmon or steelhead fish hatchery.

4. The County Water Resources section is currently conducting a study to identify such stream channels.

C. MAJOR RECREATION CONDITIONS

The continued population growth of the Sacramento metropolitan area and the increasing awareness of the American River Parkway, of its amenities and of its facilities has brought increasing numbers of users to the Parkway. The American River and its vicinity is particularly suited to those recreational activities which depend on, or are enhanced by, taking place in an outdoor, natural or naturalistic kind of setting. The presence of the American River in the midst of the urbanizing wedge of Sacramento County greatly increases the numbers of potential users with fairly easy access to the amenities of the Parkway.

The River itself provides opportunities along its entire length for water-dependent recreation activities. A number of "ideal" fishing locations are located along the River for the serious fishermen. Casual, Dad-and-Son-fishing is also possible. Swimming, including scuba diving, takes place along the River and is especially concentrated at a number of locations. Although the use of motor-powered craft is limited on the River, the use of non-motor "floatables" is heavy and increasing significantly. Surfboarding, at the end of an anchored rope, is also developing as informal usage of the River stream.

Land-oriented usages of the Parkway that make use of formal or informal trails through the Parkway include: hiking, horseback riding, and bicycling. The latter activity has resulted in increased use of the

Parkway with the opening of a designated, paved bicycle trail through the Parkway. With the additional bicycle trail development currently underway, this will continue to increase. In addition, Nature Trails through the more natural areas are an especially appropriate use of the Parkway.

Other land-oriented recreation activities in the Parkway make use of specific sites. These include camping, picnicking, and beach activity. Beach activity, and launch and take-out points for floatables require locations at the water's edge that need to be considered in conjunction with the water-oriented activities. Furthermore, the ever-present automobile brings with it the problems of parking, if not of passage. Whatever the increases in the various recreation usages in the future, there will be a corresponding increase in users' automobiles, barring a transportation service into or near the Parkway.

During the year 1967 the Sacramento County Parks and Recreation Department obtained statistics of use along the River from Nimbus Dam to the Sacramento River. The survey covered an entire 12-month period and provided statistics for a variety of recreation activities. For the entire year, 81,000 persons were counted engaging in various recreation activities; an additional 36,000 were counted as sightseers. During this same time, 40,000 automobiles were observed.

During the first 5 months of 1973, the Parks and Recreation Department counted usage in the Parkway three times per day. Assuming monthly

proportions of the total annual usage are similar for the years 1967 and 1973, the 1973 statistics would show 209,000 persons engaging in recreation activities, with an additional 72,000 sightseers, and 82,000 automobiles in or near the Parkway. This estimate indicates a 160% increase in active users, and a 100% increase in sightseers and in automobiles.

Estimated Usage of Parkway, 1967 and 1973 details the figures for various recreation activities in the Parkway. The most dramatic increase comes from opening of the bicycle trail which, it is reported, even now has the appearance of a mini-freeway. Substantial increases are also noted in hiking and in boating. Non-motor powered floatable craft of all sorts, including inflatable rafts, canoes, kayaks, innertubes, and nearly any buoyant means of transport can be found on the River during a summer weekend.

Detailed projection of recreation usage in the future involves not only changes in population, but also shifts in income, leisure time, and the desirability and accessibility of available recreation facilities. A projection of minimum usage may be approximated from the projected increase in population for Sacramento County. The 1970 population of the County was 635,000 persons. A medium level projection shows a 39% increase to 883,000 persons by the year 1990. That proportional increase would result in a minimum count of 291,000 active users on the Parkway in 1990 as well as 104,000 sightseers annually. Using the same

ESTIMATED USAGE OF PARKWAY, 1967 AND 1973

	Thousands		Increase
	1967	1973*	%
Picnicking	8.6	39.0	353
Camping	7.0	21.9	213
Motorcycling	5.2	8.0	54
Hiking	3.0	22.0	633
Horseback Riding	1.5	2.2	47
Bicycling	3.0	30.9	930
Fishing	33.5	49.4	47
Boating	3.1	21.1	581
Swimming	16.4	14.5	-12
Total Active Users	81.3	209.0	157
Sightseers	36.3	74.5	105
Autos	39.7	81.8	105

* As if counted three times per day.

Fall -

Spring Bend -

proportional increase, although changes in automobile usage may be forthcoming, the corresponding projected count of autos in the Parkway vicinity would be 114,000 vehicles.

In the 1967 survey, 64% of the usage occurred on weekends and holidays, while 36% of the usage occurred on the weekdays. Using this proportion for the projection, by 1990 there will be 186,000 active users, 67,000 sightseers, and 73,000 automobiles counted during the total of 110 days included in weekends and holidays. Due to changing leisure time and recreation patterns, it is likely that these estimates are quite conservative.

In the 1967 statistics, usage varied from month to month, depending on the particular recreation activity. Among water-oriented activities, swimming is most concentrated in the late summer months of July and August. Fishing varies depending upon the types of fish that are running. It is greatest in October, with a lesser peak in late February. Boating is greatest in the latter months of the year, although usage is steady throughout the summer.

Among land-oriented activities in the Parkway, sightseeing is steady most months of the year, although somewhat higher in the spring. Camping and picnicking peak in early summer. Hiking, horseback riding and bicycling all appear to occur during most of the year, with a decrease during the hot late summer months.

II. CRITIQUE OF THE 1968 PARKWAY PLAN

The 1968 Plan for the American River Parkway provides both a policy and a detailed design for the River and lands along the River--roughly defined by the 115,000 cubic feet per second flood line--to be included within the Parkway "reference line". It was prepared through the cooperative effort of citizens, represented foremost by SARA, and staff of the County Planning Department. Once approved by the Board of Supervisors, the planned Parkway became official, and it has been the responsibility of the County Parks and Recreation Department to interpret, implement and adjust the Plan, and to maintain and protect the Parkway. This alone is an immense task, but it is augmented by the fact that in the years following Plan adoption, certain inconsistencies and omissions have become apparent. No plan can be expected to foresee and address all problems and answer all questions, although it may offer guidelines for resolution of conflicts and issues as they arise. Conditions regionally and immediately adjacent to the Parkway have changed. Issues raised before 1968 Plan approval have cropped up unresolved. The following critique of the Plan is the product of a number of contributions from a number of sources, distilling comments by SARA representatives, consultant staff, public articles, and so forth. The purpose is to focus on major policy, implementation and use problems; less attention is given to details of Parkway design per se. Although basic design will be mentioned, a detailed discussion of such problems and their resolution will follow in later study reports.

A. JURISDICTIONS IN THE PARKWAY AND ADJACENT LANDS

A thorough inventory of governmental and public agency jurisdiction over the Parkway or portions of the Parkway has never been made. The Plan does not take account of the variety of regulatory interests vested in the River, its banks, levees, and so forth. Conflicting regulatory objectives--for example, flood and levee control versus aesthetic or recreational interests--have not been considered on more than an ad hoc basis. This type of inventory is theoretically required for preparation and distribution of environmental impact statements on major projects along the River, but the County and City staff involved in such reporting have to date no comprehensive listing of River-area jurisdictions. Jurisdictional gaps could be more readily understood by such an inventory as well.

How are City and County efforts at planning, implementing and maintaining the Parkway coordinated? Moreover, since the River spans incorporated and unincorporated areas, both governments are involved in regulating land use adjacent to the Parkway. The Planning Department and elected officials of the City may perceive "suitable" River environs in a somewhat different light--a more urban perspective--than the County representatives. Such differences are not necessarily objectionable but they should be planned and carried out in an integrated manner.

The Plan does not consider the extent to which the Department must be involved in review of proposed projects and actions affecting the American River Parkway. This subject covers coordination with the City, formulating compatible development criteria. It also includes effective leverage in reviewing proposals from State agencies, special districts (particularly park districts), and other jurisdictions. The procedure of environmental impact reporting, instituted since Plan adoption, is a significant boost in coordinating project review, and the Department is, of course, a "concerned agency" for proposed projects affecting the Parkway.

The Plan, while the product of outstanding "citizen participation", does not ensure continued, broad-ranged citizen involvement in Parkway policy decisions. A few County residents do, of course, serve on the Parks and Recreation Commission. However, less formalized channels of communication and cooperation between the Department and interested citizens and groups might be beneficial--might, indeed, serve to better educate residents on the complex problems of Parkway protection and use.

B. PLAN IMPLEMENTATION

Although the 1968 Plan does discuss such implementation possibilities as appropriate zoning, land purchase, and easements, in general it is vague about implementation. It should be noted that this problem of carrying out Plan policies relates directly to jurisdictional coordination because the Department depends on the cooperation of other decision-making bodies. The following list itemizes various aspects of implementation which are either neglected in the Plan or which, though treated in the Plan, have proved unsatisfactory.

1. Maintenance and protection of the Parkway. This partly is the jurisdictional problem of settling on the parties most appropriate to carry out protection and maintenance, and equipping and staffing them adequately. More basically, suitable "groundrules" must be laid for access, treatment of natural areas, use capacities, and so forth.

2. Reference line. The reference line has legal standing only as a policy guideline endorsed by the City and County governments. Insofar as it matches the boundaries of the area determined to be the American River flood plain, it does serve to define an area subject to special zoning and strict use controls. However, an "official flood line" has not been adopted by the State Reclamation Board, although such action is currently being considered. Moreover, the meaning of the Parkway reference line for

lands outside of but bordering the Parkway is an entirely different matter. Cases have arisen in which its location and/or legitimacy for placing special regulations (such as setbacks) on development have been questioned.

3. Zoning. In the County no systematic effort was made to rezone lands for conformity with the Parkway Plan, although flood (F) or flood combining zones are in effect within the flood plain. A second point in relation to zoning is the possibility that new zones or other ordinances are needed to accomplish Parkway goals. One case in point is protection of the bluffs.

4. Bluff protection. For a number of reasons, public dedication of property along theface and base of the bluffs may not be as appealing to a private owner as the 1968 Plan might have one believe. Indeed, questions have been raised as to the legality of such a requirement when a development of property atop the bluff is proposed. An expansion of the scenic corridor zone concept might help to preserve the visual qualities of the bluffs.

5. Other land use controls. The Plan outlines several methods of controlling land use or gaining public use of lands without acquiring full title (purchase). Experience suggests that those methods tried have often been less than successful; others have gone untested. In particular, obtaining easements permitting public access has been unsatisfactory; negative easements and obtaining development rights have yet to be explored.

6. Review of proposed developments adjacent to the Parkway. The Plan does not address suitable land uses, intensity of development, location, height, design qualities, and so forth for areas adjacent to the Parkway, nor was there an effort to codify such policies after Plan adoption. While the Planning Departments of the City and County might be primarily involved in such a program, the Department of Parks and Recreation should participate as well. Two major concerns might be adequate building design and setback and protection of existing vegetation along the Parkway.

Public access to and along the River. More than the 1968 Plan anticipated, the Department is turning to land acquisition to secure Parkway protection and public interests in the River and its environs. Although one reason for this is the desire to adequately preserve the Parkway from encroachment of development or to set aside recreation lands, another is to secure public access to the River. The right of public access would seem to be a legitimate requirement in new subdivision developments, based on a County ordinance establishing this right along public waterways. However, there seems to be considerable debate as to the applicability of this ordinance to the American River (is the River navigable? to what point?). Secondly, public access to and along the River in other cases (non-subdivided, or already developed lands) remains a problem. This is complicated by the unresolved question of riverbed ownership--State versus private--in many places along the River. The efforts which might be taken to untangle these

issues, which were not anticipated in the 1968 Plan, will be discussed in a later Study Report.

C. LAND CATEGORIES WITHIN THE PARKWAY

Distinguishing "natural" from "naturalistic", "recreation", "recreation reserve", and so forth is a problem which the Plan set in motion and with which the Department has been wrestling ever since. A separate section of this Study Report addresses the definition of natural areas. The ways in which such areas can be protected will be covered in later studies. Certainly, better understanding than that conveyed in the 1968 Plan is needed of the impact of man, beast, and vehicle on various types of flora and fauna. Assessment is needed of the tolerance of plants, particularly native plants, to uses such as nature study, trails, recreation, and so forth. Additionally, it appears that the landform and roothold programs proposed in the Plan never received the priority along with funding and implementation support recommended. This form of land reclamation needs further pushing.

D. USES WITHIN THE PARKWAY

Several sources, among them SARA representatives, have commented that some proposed or existing uses along the American River Parkway conflict among themselves or are not suited to the Parkway as a River-oriented area. For example, private recreation developments have been criticized. The detailed treatment of recreation along the River will be left to another study report.

It should be noted, however, that the Plan treats the Parkway not only as a River area but as a major regional recreation mecca. Planned distribution of large recreation sites is skimpy elsewhere in the County. The existing Plan would introduce recreational activities into the Parkway that do not require the river environment.

E. RELATING THE PARKWAY TO EXTERNAL CONDITIONS

The Plan slights the pressures and impacts created by the local and regional context within which the Parkway lies. As previous comments in this "Critique" have suggested, a firmer grasp of suitable development adjacent to the River is needed, and more effective ways of fitting this development to the Parkway must be formulated. The River is, after all, an irreplaceable and valuable feature of the region. Residential, commercial, etc., land is far more available regionally; these uses should not crowd the Parkway. On the other hand, the fact of regional urban growth--the increased traffic along and across the River, increased Parkway use, and development of lands adjacent to the Parkway--must be faced squarely. It is, however, the responsibility of regional land use and circulation planning to adopt policies which will not detract from the Parkway open space value when better alternatives are available. For instance, regional circulation and transportation plans which foresee an expanding web of freeways and River crossings eastward should be reevaluated. Only in conjunction with sensitive regional planning can a detailed Parkway Plan hope to preserve and enhance the River area.

III NATURAL AND RECREATION AREAS

A. INTRODUCTION

The General Plan for the Parkway calls for designation of areas of the Parkway in two categories: Natural, and Recreation Areas (with some Recreation Areas designated as Recreation Reserve). The General Plan defines a Natural Area as:

> A continuous strip within the Parkway in which the environment will be encouraged to develop naturally. Man-made improvements will be limited to facilities that are needed for the public's enjoyment of the natural environment.

The goals of the Parkway call for the existing natural river banks and wilderness areas to remain as unchanged as possible. This goal is addressing the preservation of natural conditions. It is reasonable to expect that in the efforts to preserve and maintain natural conditions in the Parkway, actions which add to the natural conditions or which move to restore natural conditions, are not excluded. Where the Plans call for an unchanged condition, the intent is not to exclude those actions which restore or enhance the natural state. Thus the Plans should be interpreted as favoring enhancement or restoration of vegetation and wildlife conditions, as well as allowing the introduction of native species where it is determined to be feasible.

The Plan calls for a continuous Natural Area, so that the entire length of the Parkway can be experienced in detachment from the urban features of the community. With the increasing appearance of man-made features in the vicinity of the Parkway, such as

bridges, housing developments, and individual home sites overlooking the River, a totally non-urban experience may have already been foreclosed. It is still possible, however, to minimize the physical or visual intrusion upon the Parkway if appropriate measures are taken. The evaluation of the designated Natural areas and the feasibility of a continuous strip of natural area is part of the examination of the balance between Natural and Recreation Areas.

The Parkway Plan defines a Recreation Area as:

> An area to be devoted to active and passive urban-type park uses. All areas which are NOT proposed to remain in a natural condition are shown on the General Plan as Recreation Areas.

The Plan recommends for Recreation Areas that:

> If a needed facility does not truly complement the natural setting, it should be placed outside the Parkway.

The major key to evaluation of the Natural and Recreation Areas is the set of Vegetation and Wildlife conditions as discussed earlier in this report. This information was considered in conjunction with an analysis of the slopes of the land in the Parkway. Further, it was considered preferable to have archaeologic sites in the Parkway remain as undisturbed as possible. Analysis of these environmental conditions and where they occur in the Parkway provides a basis for comparison of environmentally indicated Natural Areas with the existing Parkway Plans.

B. METHOD OF ANALYSIS

The six vegetative units identified in the inventory of vegetation and wildlife were evaluated for their suitability for three types of areas in the Parkway. One type of area is the natural state, as defined in the Plan. Two types of recreation and associated areas are distinguished. Developed Recreation is considered those activities and facilities requiring fixed structures or paving or involving considerable disturbance such as intense recreation usage. This would include such activities as archery, golf, camping, or picnicking at developed facilities. Undeveloped Recreation activity is considered those activities which must take place in an approximately natural area, without requiring substantial development of facilities. This includes horseback riding, hiking, and water-oriented activities such as fishing, swimming, rafting, and canoeing. Bicycle trails, although likely to require some level of trail development, may generally be considered as suitable for Undeveloped Recreation areas. Beach activities, although requiring Undeveloped Recreation areas, due to intense levels of usage, may be considered as Developed Recreation activities, especially if substantial support facilities are required. Parking for either Developed or Undeveloped Recreation areas should be considered as requiring Developed Recreation area environmental conditions. In the same manner, boat or raft launching facilities, due to heavy usage, may need to be considered as Developed Recreation areas.

The six vegetative units (where each vegetative unit includes a type of vegetation and the associated wildlife), and the three types of areas in the Parkway, are shown in the following Table. Each combination of vegetative unit and Parkway area has been assessed for three levels of suitability: desirable, indicating that the area has qualities beyond being merely suitable; suitable; and unsuitable.

VEGETATIVE UNIT ASSESSMENT

	Natural	Undeveloped Recreation	Developed Recreation
Oak Woodland	Desirable	Suitable[1]	Unsuitable
Grassland	Unsuitable	Suitable	Suitable[2]
Riparian	Desirable[3]	Suitable	Suitable[4]
Freshwater Marsh	Desirable	Desirable[1]	Unsuitable
Oak Grassland	Suitable	Suitable	Suitable[2]
Shrub Grass-Land	Unsuitable	Desirable	Suitable[2]

1. For nature trails this must be supervised or organized in some way.
2. If grass is replaced with sod or the like.
3. In selected locations, as thickets, though not sandbars.
4. If it is sufficiently far from water's edge, and only for facilities which will tolerate flooding.

These assessments were made in the light of the Nature versus Recreation discussion in the section of this report on Vegetation and Wildlife.

The topography of the Parkway, as shown on large scale aerial photographs provided by the County Department of Parks and Recreation, was analyzed for mapping of the distribution of slopes in the Parkway. Three categories of slope were identified: gentle slopes (0-10%); moderate slopes (10-30%); and steep slopes (30+%).

Each of these three categories were assessed for appropriateness to the three types of area in the Parkway. These suitabilities are shown in the following Table:

SLOPE ASSESSMENT

	Type of Area		
Slope	Natural	Undeveloped Recreation	Developed Recreation
Gentle (0 - 10%)	Suitable	Desirable	Desirable
Moderate (10 - 30%)	Suitable	Suitable	Unsuitable
Steep (30+%)	Desirable	Unsuitable	Unsuitable

The Assessment of Vegetative Units and the Assessment of Slopes were combined for each type of Vegetative Unit as shown in the table on the following page, Vegetative Unit Suitabilities. Each of these combinations was then rated on a scale from one to nine as shown in the following Table of Suitability Ranking.

SUITABILITY RANKING

	Slope Assessment		
Vegetative Unit Assessment	Desirable	Suitable	Unsuitable
Desirable	1	2	5
Suitable	3	4	7
Unsuitable	6	8	9

For example, the Vegetative Unit Oak Woodland is considered Desirable for a Natural Area and Suitable as a Gentle Slope;

this is indicated on the Vegetative Unit Suitabilities Table by D/S. This example is circled in the Table. Furthermore, the combination of Desirable Vegetative Unit/Suitable Slope is shown in the Suitability Ratings Table to have a ranking of 2. This example is also circled in the ranking Table. The following Table, Ranking of Vegetative Unit Suitabilities, shows the conversion from suitabilities to rankings for each area, slope, and vegetative unit.

The six categories of vegetative units and the three slope categories had been previously plotted on 1:1000 scale maps in the course of their respective analyses. For each of the three types of areas, the high ranking combinations were plotted on separate overlays in order to display on the maps the locations of most suitable areas. (In similar fashion, the lowest ranked combinations used are shown in the following table, High Rankings of Vegetative Unit-Slope Combinations.) For certain vegetative units, some slopes will appear in the rankings for two types or areas, indicating a possible conflict. For example, Oak Grassland on moderate slopes is suitable for both Natural Areas and Undeveloped Recreation areas. In these cases, the specific locations need to be examined for a resolution. An emphasis on the natural conditions in the Parkway could give priority in such cases to the Natural Area.

VEGETATIVE UNIT SUITABILITIES

AREA/SLOPE

D: DESIRABLE; S: SUITABLE; U: UNSUITABLE

TYPE OF AREA	SLOPE	OAK WOOD-LAND	OAK GRASS-LAND	GRASS-LAND	SHRUB GRASS-LAND	RIPARIAN	FRESH-WATER MARSH
Natural	Steep	D/D	S/D	U/D*	U/D	D/D	D/D*
	Moderate	D/S	S/S	U/S	U/S	D/S	D/S*
	Gentle	(D/S)	S/S	U/S	U/S	D/S	D/S
Undeveloped Recreation	Steep	S/U	S/U	S/U*	D/U	S/U	D/U*
	Moderate	S/S	S/S	S/S	D/S	S/S	D/S*
	Gentle	S/D	S/D	S/D	D/D	S/D	D/D
Developed Recreation	Steep	U/U	S/U	S/U*	S/U	S/U	U/U*
	Moderate	U/U	S/U	S/U	S/U	S/U	U/U*
	Gentle	U/D	S/D	S/D	S/D	S/D	U/D

*These combinations are not to be expected.

RANKINGS OF

VEGETATIVE UNIT SUITABILITIES

TYPE OF AREA	SLOPE	OAK WOOD-LAND	OAK GRASS-LAND	GRASS-LAND	SHRUB GRASS-LAND	RIPARIAN	FRESH WATER MARSH
Natural	Steep	1	3	6*	6	1	1*
	Moderate	2	4	8	8	2	2*
	Gentle	(2)	4	8	8	2	2
Undeveloped Recreation	Steep	7	7	7*	5	7	5*
	Moderate	4	4	4	2	4	2*
	Gentle	3	3	3	1	3	1
Developed Recreation	Steep	9	7	7*	7	7	9*
	Moderate	9	7	7	7	7	9*
	Gentle	6	3	3	3	3	6

*These combinations are not to be expected.

The combinations of vegetative units and slopes are being used to assess the designations of Natural, Undeveloped (low intensity) Recreation, and Developed (high intensity) Recreation Areas in the Parkway Plan. Based on the high rankings for each type of area, the following groups of slope and vegetative units were considered desirable for each area:

Natural Area:

Oak Woodland
Riparian[1]
Freshwater Marsh on Steep or Moderate Slope[2]
Oak Grassland on Steep or Moderate Slope

Undeveloped Recreation:

Freshwater Marsh[3] on Gentle or Moderate[2] Slope
Oak Grassland on Gentle or Moderate Slope
Grassland on Gentle or Moderate Slope
Shrub Grassland on Gentle or Moderate Slope

Developed Recreation:

Oak Grassland[4] on Gentle Slope
Grassland[4] on Gentle or Moderate Slope

1. In selected locations, as thickets, though not sandbars.
2. This condition not likely to be found.
3. For nature trails this must be supervised or organized in some way.
4. If grass is replaced with sod or the like.

These combinations are to be considered as the strong environmental indications for evaluation of the three types of areas.

A Final Note

Study Report II will deal with the critical problems associated with vehicular, equestrian and pedestrian access points to the Parkway. These will be evaluated in the light of Natural and Recreation Area criteria, of developmental conditions, and of existing and proposed recreation activity locations.

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